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I.—*Account of the Mountain Tribes on the Extreme N. E. Frontier of Bengal. By J. McCOSH, Civil Assistant Surgeon, Goálpára.*

[Read at the meeting of the 4th Nov. 1835]

The following pages have been compiled from original manuscripts lately put into my hands by Captain JENKINS, Agent to the Governor General on the N. E. Frontier, with kind permission to make what use of them I thought proper. Some of these letters were written from his own personal observation; others by Major WHITE, Political Agent for Assam; as also by Mr. BRUCE, commanding the Gun Boats at Suddia, so that the information contained in this digest may be relied upon. From the lively interest lately taken in the regions hereafter described, on account of tea growing there indigenously, and the probability of their speedily assuming an important aspect in the statistics of India, any facts concerning such districts will, I hope, prove not uninteresting to the public.

Few nations bordering upon the British dominions in India are less generally known than those inhabiting the extreme N. E. Frontier of Bengal; and yet, in a commercial, a statistical, or a political point of view, no country is more important. There our territory of Assam is situated in almost immediate contact with the empires of China and Ava, being separated from each by a narrow belt of mountainous country, possessed by barbarous tribes of independent savages, and capable of being crossed over in the present state of communication in 10 or 12 days. From this mountain range, navigable branches of the great rivers of Nankin, of Cambodia, of Martaban, of Ava, and of Assam derive their

origin, and appear designed by nature as the great highways of commerce between the nations of Ultra Gangetic Asia. In that quarter, our formidable neighbours, the Burmese, have been accustomed to make their inroad into Assam; there, in the event of hostilities, they are certain to attempt it again; and there, in case of its ever becoming necessary to take vengeance on the Chinese, an armed force embarking on the *Brahmaputra* could be speedily marched across the intervening country to the banks of the greatest river of China, which would conduct them through the very centre of the celestial empire to the ocean.

This beautiful tract of country, though thinly populated by straggling hordes of slowly procreating barbarians, and allowed to lie profitless in primeval jungle, or run to waste with luxuriance of vegetation, enjoys all the qualities requisite for rendering it one of the finest in the world. Its climate is cold, healthy, and congenial to European constitutions; its numerous crystal streams abound in gold dust, and masses of the solid metal: its mountains are pregnant with precious stones and silver; its atmosphere is perfumed with tea growing wild and luxuriantly; and its soil is so well adapted to all kinds of agricultural purposes, that it might be converted into one continued garden of silk, and cotton, and coffee, and sugar, and tea, over an extent of many thousand miles.

This valuable tract of country is inhabited by various races, several of which have acknowledged our authority, some that of the Burmese, and others that of China; but a considerable number have sworn allegiance to no power; and maintain their independence. Of these tribes the most considerable are the Mírís, Abors, Mishmís, Kangtis, Bor-Kangtis, Singphos, Muamárias, and Nágas.

Mírís.

The Mírís occupy that stripe of alluvial land along the northern bank of the *Brahmaputra*, from the large island Majuli (the extreme boundary of the present Rájah of Assam), to the river Dihong the northern branch of the *Brahmaputra*; and are bounded on the north by the hill country of the Abors. Till of late years, this district was deserted on account of the ravages of the Abors; but on our affording them protection, the original inhabitants have returned. The land is still very thinly populated, and the only cultivation is along the banks of the great river. Their head village is Motgaon. The manners and habits of the Mírís are wild and barbarous, their persons filthy and squalid; they use a language different from the Assamese, and make use of bows and poisoned arrows as a defence against their enemies. They are expert marksmen; and the poison used is so

fatal, that even a scratch of their arrow is followed with certain death. They eat all sorts of wild animals, not excepting those killed by their own poisonous arrows.

The Mírís are an industrious race, and partial to living in the skirts of the forests, clearing new ground, which they cultivate for a year or two, and then move off to another place, when the soil is exhausted. A great deal of opium is grown by the Mírís, which they barter for grain with the Assamese.

Abors and Mishmís.

These tribes inhabit an extensive range of mountainous country along the southern exposure of the great Himálaya chain, from the 94th to the 97th degrees of E. longitude, and border with Thibet and China. It is difficult to form a conception of the extent of these tribes, but they are not to be despised; for during the insurrection of the Muamáriás, no less than 17,000 Abors joined to drive that tribe out of Assam. It is probable that at no ancient period these two tribes were unconnected, but the Mishmís are now considered by the Abors as dependent upon them, and treated as slaves. Besides the Mishmís here mentioned as subservient to the Abors, there are several other tribes of them; such as Muzú-Mishmís and Taen-Mishmís, inhabiting the extreme branches of the Lohit or eastern channel of the Brahmaputra, who are probably independent. These tribes possess one of the lowest grades of civilization; they occupy numerous villages along the precipitous shores of the two great northern branches of the Brahmaputra, the Dihong or Sampo, and the Dibong. Their houses are so constructed, that the perpendicular side of the rock forms one wall: the floor is made of bambus, with one side supported on the rock, and the other on beams driven into the ground. The space underneath is inhabited by the cattle, and the interstices in the floor afford the double advantage of showering down all the offal to the herd below, and preventing the accumulation of filth and nastiness.

Hospitality.—Though the snows of their mountain home have narrowed their means of subsistence, and limited their intercourse to their immediate neighbours, yet they are a hospitable and even a social race; and a constant round of festivity is kept up from one end of the year to the other. Each chieftain kills the fatted bullock in turn; all his associates are invited to partake of the good cheer: the host is in his turn a guest at the next feast; and thus a reciprocity of entertainment is insured. Nor are these hospitable rites allowed to be forgotten; the scull of every animal that has graced the board, is hung up as a record in the hall of the entertainer; he who has the best stocked

Golgotha, is looked upon as the man of the greatest wealth and liberality; and when he dies, the whole smoke-dried collection of many years is piled upon his grave as a monument of his riches, and a memorial of his worth.

Migration.—These people, accustomed to a temperature at and about the freezing point, seem to dread an exposure to the heat of the low countries during the summer, and make their descent to their markets at Suddia only in the cold weather, and take their departure to their snows as soon as the *Simala* tree puts forth its blossoms.

Trade.—They bring along with them a few bags of musk, and musk-deer skins; some ivory; a few copper pots, which they obtain from the same country; and a considerable quantity of a vegetable poison called *Bis-Bisá*, used in poisoning arrows. These they exchange for glass beads, of which they are very fond, and cattle, for the purpose of eating. The musk is for the most part adulterated; a portion of the genuine musk being abstracted to make into artificial bags, and its place filled up with dried blood.

Poison.—The poison is of a very superior quality, and is in great request by all the neighbouring nations for destroying wild animals. It is contained in a small fibrous root, which they tie up into little bundles. It is prepared by pounding the root to powder, and mixing it up with the juice of the *Otenja* tree, to give it tenacity, and make it adhere to the arrow head. They keep the plant a great secret, and take the effectual precaution of boiling it before leaving their homes, so as to destroy all possibility of its being propagated.

Road to Thibet.—The route to Thibet, adopted by pilgrims, leads through the Abor country, along the course of the Dihong or Sampu, and is accomplished in sixteen days from Suddia. The route, as mentioned by Mr. BRUCE, is as follows:

From *Saddia* to *Kaj-jin*, five days' journey; thence to *Lak-qui*, one day; *Gha-lum*, one day; *Ma-ma-nu*, one day; *Dullá*, one day; *Omono*, one day; *Hullí*, one day; *Sum-lay*, one day; *Hán-nay*, one day; *Kum-day*, one day; *Rí-sháh*, one day; *Bhá-lu*, one day. *Bhálu* is the frontier town of Thibet. About four days' journey beyond it stands the city of *Ro-shí-máh*, containing fine buildings, and a large civilized population, and a government purely Chinese.

The Grand Lama himself, and all head officers throughout Thibet, are appointed by the Emperor of China, and receive allowances from the Chinese government. The chief of Suddia seems to have considerable influence with the Thibetans, and the intermediate hill tribes. Almost all pilgrims apply to him for a passport, and he is in the habit

of sending an escort with them as far as Ma-ma-nu, whence they are passed along from one tribe to another till they arrive in the country of the Grand Lama. There is another route into Thibet viâ Brahmakúnd, through the country of the Mishmís; but it is at all seasons of the year covered with snow. There is but little trade now carried on with Thibet, and that little is chiefly effected by pilgrims. The few things imported are smoking pipes of Chinese manufacture, woollens, and rock salt. In exchange for these they give musk, ivory, and *Bisá* poison. Assamese captives at one time formed a considerable trade; but since these latter came under the protection of the British, that lucrative branch has been exterminated.

During the flourishing period of the Assam dynasty, we are informed*, that the kings of Assam were in the habit of sending presents to the Grand Lama, and that a caravan consisting of about 20 people annually resorted from Lassa to the Assam frontier, and transacted merchandise to a very considerable amount with the Assamese. The Thibetans took up their quarters at a place called Chouna, two months journey from Lassa: and the Assamese, at Geganshur, a few miles distant from it. The trade of the former consisted of silver in bullion to nearly a lakh of rupees, and a large quantity of rock salt. This they exchanged with the Assamese for rice, silk, lac, and other produce of Bengal; but this trade has for many years been discontinued.

Kangtis.

The Kangtis, the most civilized of all these mountain tribes, inhabit that triangular tract of country bounded by the Lohit on the one side, by the Dibong on the other, and by the mountainous country belonging to the Mishmís on the third. They are descended from the Bor-Kangtis, a powerful race situated on the sources of the Irawadí. About 50 or 60 years ago, they emigrated from their native country, and availing themselves of the civil war then raging throughout Assam, they took forcible possession of the country they now enjoy, ejected the reigning chieftain, the Suddia Cowa Gohaing; and the Kangti chief, usurping his name and jurisdiction, reduced his subjects to dependence or slavery. The Kangtis, by a vigorous mode of government, and holding out an asylum to refugees from other states, soon rose to eminence. They are now a superior race to all their neighbours; they are tall, fair, and handsome, considerably advanced in civilization, and are endowed with no small share of military courage. Their religion is Buddhism; but Hinduism is gaining progress. They are amongst the few tribes who have a written character, and can read and write the Burmese language, and understand it when spoken.

* HAMILTON's Gazetteer.

Their own language, though written in a character a good deal resembling the Burmese, is quite different, and closely resembles the original Ahom. Every boy is taught to read and write it, by the priests. Suddia is the capital of the Kangti country, and the chieftain is known by the name of the Suddia Cowa Gohaing, and claims descent from the royal family of Assam.

Suddia is situated on the right bank of the Kunil or Kundil nallah, and about six miles above its junction with the Lohit. It is a place of some importance, and has a population of about 4000 men, exclusive of women and children. Its trade is rapidly increasing; all the necessaries of life are procurable: its exports are gold and silver; amber, musk, and ivory; Kampti daus, Chinese and Burmese trinkets; Bisá poison, and dye-stuffs, called Mishmí-títa and manjít. The Mishmí-títa, manjít, and lime, triturated with water, and allowed to digest in an earthen pot for a month, makes a beautiful permanent red dye. The daus are of a high order, and are so much prized as to bring 12 Rs. a piece. They are manufactured by a rude wild race, called Kunungs, (slaves to the Kangtis,) who are situated on the extreme branches of the Irawadí, who can neither read nor write, and are little removed above the brutes.

Suddia station.—The country around Suddia is composed of the richest alluvial soil, well adapted for cultivation; but is generally flat and liable to inundation. A large portion of it is waste, and overgrown with jungle: it is closely surrounded by the snowy mountains, which are only about thirty miles distant; and the water of the river is so cold, that of itself it serves to cool wine for table.

Force.—Suddia is the most advanced post we possess on the N. E. Frontier. Three companies of the Assam Light Infantry are stationed there, under the command of a European officer, invested with political authority. Two gun-boats are also stationed there, also under the command of a European: each boat has one 12-pr. mounted on slides, and is well manned and equipped for service: one of the boats is manned by Kangtis, who give much satisfaction. There is also a small stockade erected, with a few guns mounted. Suddia has hitherto preserved a healthy character. It is likely soon to become the headquarters of the Assam Infantry. The Suddia Cowa Gohaing, though he pays Government no tribute, acknowledges the Company's supremacy, and is bound to furnish a contingent of 200 men. That contingent is supplied by arms and ammunition at the expense of Government; they are drilled by the Subadar of the Assam Light Infantry, four months in the year, and the arms, when in want of repair, are forwarded to head-quarters at Bishnath.

The Suddia Cowa Gohaing is believed to be a firm friend of Chandra Kant's, the ex-rájah of Assam; when formerly driven from the kingdom, the Suddia Cowa had influence enough at the court of Ava to obtain the assistance of the Burmese to restore him to his throne; and now that Chandra Kant is again deposed, he is thought to be constantly intriguing to have him again placed on the throne.

Bor-Kangtis.

The Bor-Kangtis are a numerous and powerful race, situated amongst the mountains whence the Irawadí takes its origin. They are under the government of Ava, and supply a contingency to the Burmese army. Experienced Burmese officers are constantly traversing their country, for the purpose of drilling them, and inspecting their arms and ammunition. The capital of the Bor-Kangtis is Manchí, on a remote branch of the Irawadí. This place was visited by Lieuts. WILCOX and BURLTON in 1827, by an overland route, cut across the mountains from Suddia. The journey occupied about 12 days: they were kindly received by the Bor-Kangti chief, who gave them every information about the sources of the Irawadí, and convinced them that from the smallness of the streams, it was impossible for any of them to afford a channel for the waters of the Sampu. The main stream of the Irawadí is there fordable, and not more than 80 yards broad.

There is a silver mine in the Bor-Kangti country; but it has never produced more than 8000 rupees a year. It might be turned to much more advantage; but the possessors are afraid of increasing its revenue, lest by doing so, they should excite the avarice of their neighbours. There are also mines of lead and iron in this country.

Múnglung Kangtis.

We have lately come into intimate contact with another tribe of Kangtis called Múnglung: these from dissension amongst themselves, and from the oppression of the Burmese, have lately dispatched about 200 of their tribe to stipulate for settlements in the British dominions, and report on the prospect of the country around Suddia. Should their report prove favourable, about 5000 more have expressed their desire to emigrate.

Singphos.

By far the most powerful and the most formidable of these hill tribes are the Singphos; they are also the most numerous, and are scattered over the greatest extent of country. They are bounded on the north by the Lohit river; on the east by the Langtan mountains, which separate them from the Bor-Kangtis; on the south by the Patkoí range, which divides them from the Burmese Singphos, from whom they are descended; and on the west, by a line drawn south from Suddia, till it meets the last mentioned mountains.

The Singphos are divided into 12 tribes, each having its own chief or Gaum ; but every chieftain maintains his own separate independence, and seldom unites with any other, unless it be to punish some aspiring chief obnoxious to them all, or in making plundering excursions upon neighbouring states. The Singphos have for several generations been the terror of the wretched and degenerate Assamese, and were in the constant habit of making irruptions into their country, sometimes as far as their very capital itself ; of plundering their temples, laying waste their country, and carrying off the inhabitants into slavery. Since the British troops have had possession of Assam, these inroads have been prevented ; but as might be expected, they are somewhat impatient of that restraint, and have once or twice endeavoured to resort to their old habits.

To give an idea of the extent to which the devastations were carried on, the late Captain NEUFVILLE, received from the Singphos alone upwards of 7000 Assamese captive slaves, and perhaps there are 100,000 Assamese and Manipurís still in slavery throughout the dominions of Ava.

About five years ago, a body of them amounting to about 3000 men, armed with spears, daus, and a few musquets and jinjals, under a chief called WAKUM KOONJIE, made an advance against the station of Suddia, with the confident intention of carrying away in chains every seapoy present, and of driving the British out of the country. This was a plot of three years' concocting ; large stores of grain were accumulated in convenient depôts, and shackles for 10,000 prisoners were all in readiness ; but the whole force was shamefully repulsed by the then political Agent, Capt. NEUFVILLE, at the head of a handful of men of the Assam Infantry, and a few armed Kangti and Muamária militia, and driven in consternation into their lines.

The Lubona only of all the 12 chiefs took part in this irruption, and he has taken an active hand in the late disturbances, headed by the Duffa Gaum.

All the chiefs have claimed our protection, though no tribute is exacted from them ; with one or two exceptions, they have acted up to their engagements.

The Busa Gaum or chief is a man of superior understanding, and was entrusted by the late Agent to the Governor General, the lamented Mr. SCOTT, with a good deal of confidence, and had an allowance from Government of 50 rs. a month, as an organ of communication with the other chiefs, and a spy upon their actions. The late Capt. NEUFVILLE was also confident in his integrity, and made proposals to him to desert his own country, and live on lands to be granted him at Burhath and

Jaipur, and allow his native hills to become a wilderness, and form a natural barrier against the incursions of the other tribes.

The population of the Busa Gaum is about 9 or 10,000 men, exclusive of women and children. He furnishes a contingent of about 100 men, and is supplied with arms and ammunition.

The most influential of the unfriendly chiefs is the Duffa Gaum. Only a few months ago he made a hostile incursion against our ally the Busa Gaum, and massacred every man, woman, and child he could get near; the Busa Gaum narrowly escaped with his life, and some of his own family were cut to pieces. After two or three skirmishes, the marauders were dislodged, and driven to their hills, by the force at Saddia; but the Duffa, instead of repenting of his atrocious act, and retiring to his home to await the consequences, commenced playing the despot in another quarter, threatening every one with his vengeance who acknowledged British protection, and even beheaded some who refused to conform to his will. By the latest accounts, the state of affairs in that district were very troublesome, and the whole of the Assam Infantry disposable are already on the move for its protection.

A feud has for a long time existed between the Busa and the Duffa Gaums, and the inroad lately made by the latter admits of some palliation, as it avenged a similar one formerly made by the Busa Gaum.

Rude as is the state of society amongst the Singphos, they are not without the distinction of caste; but are divided into Thengaís, My-yungs, Lubrungs, and Mírups.

They have no religion properly their own, but have patched up a creed from amongst the superstitions of all their neighbours, and decorated their rude temples with ruder idols of all religions.

The Singphos are not a branch of the Shán tribes: tradition traces their origin to the confines of China or Thibet: the language is entirely different from that of the Sháns, and is unwritten.

Polygamy is patronised, and every man keeps as many wives as he chooses, free women or slaves; and treats the offspring of both without partiality. Infanticide in all its shapes they abhor.

It is the custom of the country to bury the dead. Those of the poorer classes are interred soon after death; but the chiefs and principal individuals are sometimes not buried for years. The reason alleged for this consummation of the funeral rites, is to allow the widely scattered relations of the deceased to have time to attend, who would not fail to take deadly offence at their not being allowed an opportunity of paying reverence to the ashes of the head of their family. Not knowing the art of embalming, the body after death is removed to a distance from any habitation, till decomposition is completed.

After that it is deposited in a coffin, and conveyed to the house of the deceased chief, where it lies in state, surrounded with all the insignia the illustrious individual enjoyed when alive. When all the relatives have assembled, or communicated their not being able to attend, the coffin is committed to the earth, and a mound of clay, surrounded with a curious trellis-work of bambus, is raised to his memory. If the person has died a violent death, a buffalo is sacrificed as a propitiation to their deities, and the head is fixed to a cross, and placed near the grave; but if he has died in the course of nature, no sacrifice is considered necessary.

According to the law of inheritance, the patrimony is divided between the eldest and the youngest son; while any children that may intervene are left to push their own fortunes as they best can. The eldest son succeeds to the title and the estate, while the younger, carrying away all the personal and movable property, goes in quest of a settlement for himself.

Tea.—The tea tree grows wild all over the Singpho country, as also upon all the hills in that part of the country, and is in general use by the natives as a wholesome beverage. The tea tree, according to Mr. BRUCE, was known to be indigenous to these climates about ten years ago; and during the Burmese war, large quantities of it were sent into Sattia by the Busa Gaum. How long the subject might have lain dormant is doubtful, had not the affair been again brought to the serious notice of Government, at a time the most favourable for doing so, by the scientific investigations of Capt. JENKINS and Lieut. CHARLETON of the Assam Infantry, to whom we must acknowledge ourselves indebted for a revival of its existence, and for the boon it must necessarily confer upon our country*.

Mr. BRUCE has lately been on a tour to the Singphos, and mixed in social intercourse with them. He saw many thousands of the trees growing in their native soils, and brought away some plants and specimens of the leaves and seeds. The trees were of a very considerable size, so as to merit a higher rate of classification than a plant or a shrub: he measured one of the largest, and found it 29 cubits long, and about four spans in circumference at the base.

Mr. BRUCE mentions the following as the native process of making tea, though he does not seem to have witnessed it. First, the leaves are collected from the tree, and put into large boilers containing water. As soon as the water boils, the decoction is drawn off, and

* This paper was written before the appointment of the scientific deputation to the tea districts, whose report may be now shortly expected.—ED.

thrown away, and the leaves, being taken out of the boiler, are put into a pit dug into the ground, and lined with some sort of leaves, to prevent the tea coming in contact with the earth. When the pit is filled with tea leaves, it is then spread well over with a thick layer of the other leaves, and after all, covered over with earth, so as to exclude all air. In this state it is allowed to remain for two or three months, when the pit is opened, and the tea sold on the spot to traders, who pack it closely up in the joints of bambus, earthen pots, &c. and transport it to other parts of the country on mules for sale. He also mentions, that many thousand maunds of tea are manufactured at a place called Polong, and exported to China. Where Polong is situated, I have not been able to determine.

In addition to the tea tree, the Singpho country has lately been discovered to abound in many valuable gums, well adapted for varnishes.

Burmese Singphos.—The Singphos of Assam are separated from the Singphos subservient to the Burmese, by the Patkoí chain of mountains; and though these two races are entirely unconnected with one another, and independent, yet a constant friendly intercourse is maintained between them. The Burmese Singphos occupy a very extensive tract of country on both sides of the Irawadí, and from the Patkoí mountains eastward to the borders of China.

Trade with China.—As the Chinese carry on a very considerable trade with these Singphos, and through the medium of their country with Assam, I shall endeavour to mark out particularly the line of communication between the two countries. The Chinese province of Yunan being separated from a navigable channel of the Irawadí, only by a mountain chain, inhabited by Sháns, tributary to Burmah, the Chinese merchants, by a short land journey across these mountains, convey their merchandise on mules, to a place called Catmow, on the banks of that river. There the Irawadí is a large stream. The channel is unincumbered with rocks, trees, or sandbanks; the shores are composed of a stiff hard clay, not liable to tumble down, and present every facility for navigation. The exact position of Catmow seems undefined. The merchants, having loaded their goods on boats, easily procurable, commit themselves to the gentle current, dropping down with the tide due south, day and night, and on the third or fourth day arrive at the mouth of the river called Nam-yang. After ascending this river four or five days in a north-west direction, they come to a town called Mung-kung, or Mugaum, the chief depôt of Chinese trade situated at the junction of two smaller rivers, the one called Nam-kung, or the Mugaum river, the other, Nam-yang,

retaining the name of the united stream. The Mugaum river is navigable for 40 or 50 miles above the town, and for small canoes, a good deal farther, and extends in a northern direction. The Chinese wares are transported up this river as far as practicable, and afterwards conveyed overland through Hukung and Busa to Assam. The journey from Mung-kung to Assam occupies from 15 to 20 days.

Route into China.—There are two other routes to China besides the one mentioned, the one by a place called Senwa, and the other by May-nay, both of which run direct into Burmah, but little more is known about them than their name. The intercourse between China and Assam by any of these roads is extremely tedious, and can only be followed by a trading people, who traffic as they move along, without regard to time or distance. A knowledge of the extreme navigable eastern branches of the Brahmaputra has pointed out a much shorter and more convenient pass, and this was travelled by Lieuts. WILCOX and BURLTON on their visit to the Bor-Kangtis. Following up the river Noá Dihing, which flows into the left bank of the Lohit, a few miles above Suddia, they were able to proceed by water conveyance to within nine days' journey of Mung-lang, on the banks of the Irawadí, and without experiencing any serious difficulty or inconvenience farther than the jungly state of the country.

Importance of a Road.—A road passable even for mules or oxen between the navigable branches of the Noá Dihing and the Irawadí could not fail to be of great national benefit, and would open a channel for the direct importation of all the valuable productions of Central Asia. It would also tend to the complete civilization of the savage mountaineers, who inhabit these regions, and enable a force to penetrate into the centre of the country, whither they can at present retreat with comparative impunity. It is doubtful how far those tribes would contribute to the formation of roads, or the furtherance of any attempt on our part, to extend our intercourse into the interior; they have hitherto been jealous of any encroachment, and not many years ago, gave proofs of the spirit by murdering the individuals who conducted Lieut. BENNETT to the Patkoí boundary.

But the time, it is to be hoped, has already arrived when these fertile tracts will be taken under our especial protection; when the untutored barbarian must submit to civilization and improvement, and his wilds and his wastes to the ploughshare and the hoe of British agriculture.

The most important articles of trade exported by the Chinese from the Singpho country are gold dust, precious stones of various colours, and ivory.

Gold Dust.—The gold dust is procurable from most of the streams

of the Brahmaputra; but the gathering it is but a poor trade, and is now but little followed. The place most celebrated for its precious stones is Mung-kung or Mogaum.

Precious Stones.—On a range of hills near it, a great number of deep mines are dug, and the working of them affords occupation for many thousand inhabitants. When a stone of moderate weight is found, it is hoisted to the mouth of the shaft by a windlass erected for the purpose. But they frequently meet with large masses, which they have not the power of moving: these they contrive to break to pieces.

Mining.—The workmen begin by kindling a strong fire all over and around the precious stones, till it is well heated; they then mark off with some powerful liquid, the piece they wish to break off, a large stone is suspended from the top of the shaft perpendicularly over the piece to be broken off, and when all is ready, the stone is cut away, and falling with great impetus upon the mass below, breaks off the fragment exactly according to the line drawn with the liquid. It is difficult to account for this mysterious liquid being able to prevent the whole mass from being splintered, and how it should preserve such a line of separation; yet such is the native belief, and it is not improbable that its effect is merely imaginary, or that is practised from some superstition.

These stones are afterwards cut into convenient pieces by means of a bambu bow with a string of twisted wire, the string being applied to the stone and used as a saw, while its action is assisted by some sort of pulverized mineral*. As might be expected, much bloodshed is frequently the consequence of finding these hidden treasures. When any doubt arises about the party who first discovered one, or about the right of possession, bloody battles ensue with short swords in hand between whole villages. Large emeralds are allowed to lie around the pits unclaimed by any one: no one venturing to carry them away, lest every one should fall upon them in vengeance. These precious stones are afterwards carried on mules to China, and are sold at very high prices, some of them bringing 7 or 800 seers weight of silver. The Burmese governor levies a tax of two seers on every 10 that are exported. These mules are driven along in gangs of 20 to 30; the drivers go armed with swords and matchlocks, and guide their beasts of burden by word of mouth. The route they pursue to China is via Catmow or the Irawadí, and the overland journey from Mung-kung to Catmow occupies about nine days.

Amber.—Besides the mines of precious stones, there are several amber mines in the province of Hukung, which are wrought to con-

* Doubtless corundum: this is the common mode of cutting hard stones.—Ed.

siderable advantage. The amber is cut into cylinders about $\frac{1}{4}$ inch in diameter, and two inches long, and is worn as an ornament stuck through a hole in the lobe of the ear, both by Assamese and Burmese.

Ivory.—A large quantity of ivory is exported by the China merchants. It is almost all obtained by the Singphos, from shooting the wild elephants with poisoned arrows fired from a loaded musket. When once they get upon the tract of a herd, they continue the pursuit for days together, taking up favourable positions upon trees, or lying in wait in the long grass, till they can take a fatal aim. Vast numbers of these noble animals are destroyed in this manner, both by the Singphos and Kangtis; they are as susceptible to the fatal effects of poison as the smaller animals, and fall down dead immediately after being slightly wounded. Their teeth are struck out by the hunters, and the carcasses are left to be devoured by the beasts of prey.

Chinese returns.—In return for these valuable commodities, the Chinese bring into the Singpho country, nankins, silks, lacquered and China ware, lead, copper, and particularly silver.

A great portion of the silver that comes into Assam through the Singphos is stamped with Chinese characters. It can scarcely be called a coin, but a piece of bullion; and appears to have been made by scooping out a small round hole in a piece of clay, then filling it with molten silver, and before it becomes cold, impressing it with the Chinese stamp. Not two of these lumps of silver are of the same value or size: their intrinsic worth is ascertained by their weight, and is found to vary from two to 10 rupees.

Bullion.—Though the metal is very pure, it is called *kacha rupa*, and one sicca weight of it is fixed as equal to only half a sicca of the properly coined metal. No inconvenience arises in purchasing articles of small value; the hill tribes take out their dau, and chop it into pieces even to the portion of a pice. This *kacha rupa* is eagerly purchased by the chiefs in Upper Asam, who, after adulterating it largely, cast it into their own coin, and thus realize an enormous profit. These chiefs have most of them mints of their own, and are in the habit of coining rupees for any one who will give them the raw material, retaining only 10 per cent. for their trouble.

Muamarias or Mattuks.

The country of this tribe is bounded on the N. by the Brahmaputra, on the S. by the Burí Dihing; on the E. by a line drawn S. from the mouth of the Kunili nallah to the Burí Dihing, and on the W. by a line drawn from the mouth of the river Dibunu to the Burí Dihing. About 1793, these people rose in arms against the reigning Rájah GOURINATH SINH, and after many bloody engagements with the royal

troops, at last succeeded in driving him from his throne and kingdom, and in appointing a successor of their own choice. During the period of their ascendancy, they committed the most dreadful ravages upon the country, and the original inhabitants: great portions of it were deserted, and even till this day, it has never regained any thing near its former prosperity. But these lawless plunderers were not allowed long to enjoy the fruits of their conquests; they were speedily driven from the capital by 1000 sipáhís, under Captain WELSH, and retreated to the districts which they now inherit. The head of this still powerful clan is known by the name of the MATTUK Rájali, or more commonly, by that of the *Bara sènapatí* (great general). During the Burmese war, he maintained his independence; but on our taking Rangpur, he claimed our protection, and has since manifested his sincerity, by a zealous endeavour to render every assistance in his power in the advancement of our plans.

The greater part of the country allotted them is a desert waste, and only the banks of the river Diburí are inhabited. The population amounts to about 60,000 men, inclusive of women and children. The capital is Rangagora. The state is allowed about 500 musquets and ammunition according to treaty, and supplies a large contingent. They profess the Hindu religion; but act so little in accordance with its tenets, that enlightened Brahmins scarcely acknowledge them.

The *Bara senapatí*, with all his affability and apparent deference to our authority, is by some considered not entitled to perfect and unlimited confidence. Situated between two powerful states, the British and the Burmah, his policy seem to be to maintain good terms with both; and in the event of another Burmese invasion, it is to be feared, he would preserve neutrality, till he saw how the scale was likely to turn, and then join the stronger party.

Nágas.

The next border tribes met with in proceeding westward are the Nágas. To assign limit to their country seems almost impossible, and even to number their numerous tribes, no less so; they are scattered all over the mountainous ridge that divides Assam from Manipur, to which state some of them are tributary, some to Assam, and some even to the Burmese. There is no one individual tribe of any formidable consequence amongst them, and there is but little inclination to coalesce, they being constantly embroiled in petty feuds. Their houses are built on the most inaccessible points of the mountain, and planned for every-day defence. They are represented by the inhabitants of the plains as robbers and murderers, and are so much the dread of all, that little of their economy is known.

Brine Spring.—One of the most remarkable circumstances relating to their country is the number of brine or salt springs in many parts of it.

At Burhath, on the river Disung, there are about 20 of these brine springs, from most of which the Nágas are in the habit of making salt. These wells are dug to a considerable depth, and the brine varies in intensity, probably according to the access of fresh water from the surface; and being situated in a valley, and having no protection from the rain, they are generally filled in the wet season. The consequence is, that the manufacture is carried on only in the cold weather.

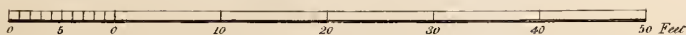
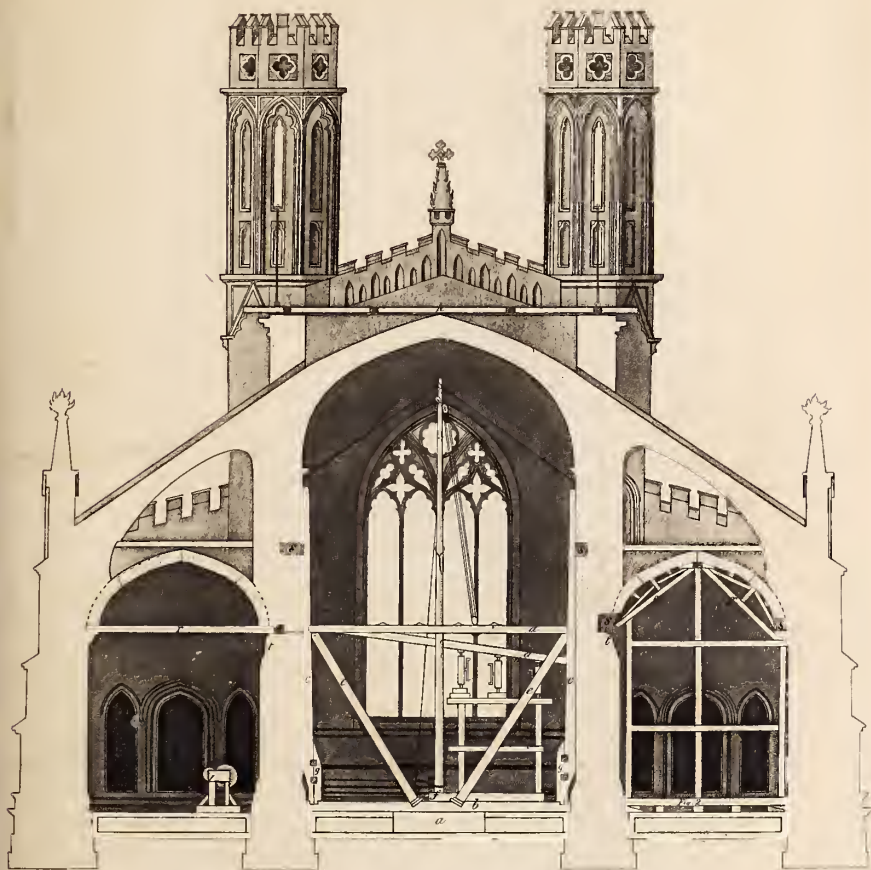
Manufacture of Salt.—Some of the best of these wells give 10 sicca weight of dry salt to the seer of water, and others, only three or four. The process of evaporation is carried on by filling the joints of large bambus with brine and suspending them in an earthen trough, filled with water, which answer for the purpose of a boiler, and in this rude way, the brine in the bambus is evaporated, till salt is formed. These mud troughs are every season broken down, and being triturated with water, afford a strong brine from which other salt is formed.

So tedious and unskillful is the manufacture, that the salt made from these wells cannot be made at less price than the same quantity of salt transported from Bengal.

II.—*On the Method employed to remove the Vaulted Roof of St. Peter's Church in Fort William, illustrated by a Section, (Plate V.)*

Works of engineering skill come peculiarly within the limits pointed out by the motto on our title page, as fitted for the *Researches of a Scientific Society or Journal*: “The performances of man,” of such a class in this country, and under British rule, are, it is true, but rare and trifling compared with the noble efforts of art, which grow up from day to day under the eye of an observer in Europe. There, letting alone tunnels and railways of gigantic enterprize, we hear of half an elliptic arch sprung by the celebrated BRUNEL from a buttress and carried to a semi-span of *seventy feet, without centering*, by the mere adhesion of the cement!—of an iron suspension bridge at Fribourg in Switzerland thrown over a ravine of 170 feet deep, in a single bold span of more than 900 feet from rock to rock, far surpassing the Menai bridge, or even the designed bridge from St. Vincent's rocks at Clifton, which latter we regret to hear has been abandoned, in consequence of the riots in Bristol, and the destruction of that wealth which would have been so well bestowed upon this noble work.

SECTION OF ST. PETER'S CHURCH, FORT WILLIAM.



References

- a Foundation of masonry to sustain the stress of the Shores
- b Foundation beam
- cc Uprights fitting the moulding of the Pillars
- d Straining beam
- cc Struts
- f Straining Sill
- gg Moveable centre supporting the aisle Vaults under demolition.
- h Section of a suspension platform from which the workmen were able to demolish the Nave vault in security
- l The suspension ropes fastened to the towers
- r Beams to which the punkahs were suspended
- s Holes made in the pillars and buttresses for the reception of the punkah beams
- t Portions of the pillars broken off in consequence of the insertion of the punkah beams



We have but little indeed to bring forward in rivalry of such magnificent undertakings; howbeit, there have been schemes of vast magnitude projected, and some under a Viceroy such as Lord W. BENTINCK, partial to engineering pursuits, might ere this have been put in execution. The draining of the Salt-water lake, (were it conceded to be a salutary measure) would be feasible enough. The line of wharfs or jetties on the Strand is actually planned and estimated for. The Rajmahl line of survey is a splendid specimen of mapping; and although we have no anticipation of seeing it undertaken, the results of the inquiry will, we hope, be given to the public in a volume, with all its sections, by its projector our Indian Belidor. Of architectural achievements we have less to boast. Twenty years since, money was bequeathed by a rich native for the erection of a College at Huglí, and yet nothing has been done unto this day. Are architects wanting, or are the curators anxious to appropriate the money for other purposes? We have seen more than one tasteful design, but how is an artist ever to satisfy the views of a numerous committee, not more than one or two of whom perchance have any notion of architectural propriety? In feeble imitation of the Parliamentary Church Committee at home, we have a private fund created by rupee contributions for the erection of places of worship in the interior; but it is far too poor to aim at ornament in its humble structures. The Martiniere is the only public institution, erected within the last year or two, that has real pretensions to correct taste in its exterior elevation. It is strangely disfigured by a high wall round the ground, and the arrangements of the interior have been marred by an imperfect conception at starting, of what would be required in it.

An observation forces itself upon us when viewing the noble portico of this building, of the Scotch Church, or of the mint, with their handsome flights of stone steps;—that the purity of Grecian temple architecture cannot or ought not to be preserved under the altered circumstances of the present age. Men no longer resort on foot in daily processions to the sacred vestibules of their gods. They drive in comfortable carriages, and would fain dismount under shelter from the sun and the rain. Is it not a fault of grievous magnitude then, that neither of these three buildings possesses a carriage access? and that at the Mint, for instance, bullion cannot get within 100 feet of the hall of weighment, except on coolies' heads. The Government house is in this respect better provided; but here the basement entrance has been made an eyesore, and a mere secondary object, instead of the primary one, being in constant use. The portico of the Martiniere was intended for carriages, but this object was sacrificed to the gaining of space for a play-ground, and the road

is now brought up at right angles with the foot of the steps, which has an unseemly and awkward effect.

The native architect in the palaces of the east provides not for carriages, but how suitable is the lofty arched gate with its music galleries for the train of towered elephants and horsemen issuing from the interior court. Under the sloping *chhaja* or cornice of the native dwelling, or *baithak-khíneh*, the architect inserts iron rings for the striped pavilions it is intended to bear. They look natural to it, as they are necessary to the climate; whereas how may not the Ionic façade of the Martiniere be disfigured hereafter, perhaps, by venetians run up between the columns of its fine portico, as in the left wing of the Government house, or by matted hoods gracing the southern windows of each wing?

Too much stress cannot be laid on the proper adaptation of style to the climate. The architect's duty is but half performed, if he provide not for every contingency to which his building may be subject, whether in respect to durability or to convenience; and even when the former is attended to, the latter is too frequently neglected.

A striking instance of the bad effects of inattention to apparently trivial objects of this nature is afforded in the subject of the present notice. Major HUTCHINSON designed and executed a gothic vaulted church roof in brick, the first attempted in India. He neglected to make provision for the hanging of punkahs, and upon a representation of their being wanted, the executive department, with little calculation of the disturbance of equilibrium or strength of materials, ordered holes to be cut at the head of the clustered columns, to admit beams to swing them. Had the architect at first, as he has now done, let in iron rods to sustain the punkah ropes, his work would have been uninjured, and Government have been saved double, nay triple, expenditure; and his fame have been preserved from unmerited censure. Few people in such cases calmly inquire into particulars; they ask, who raised the fabric, and upon his head lay the onus of the failure.

We are glad, with reference to this last fact, at having obtained permission to make public the report of the real circumstances given in to the Military Board in June, 1832, with its explanatory section.

It is necessary to recapitulate to such of our readers as are unacquainted with the facts, that about six years ago the vaulted roof of St. Peter's was condemned as unsafe, and was ordered to be demolished. The keystone or vertex of the central and side vaults had opened from end to end, and other dangerous symptoms were observed. Committees were held, and a variety of opinion as to the cause elicited, but the necessity of demolition was general, and Major HUTCHINSON was

intrusted with a task seemingly as difficult as the original construction, and fraught with more danger to the workmen employed.

The true nature of the case will strike every one who looks attentively at the accompanying section, namely that the cutting of the holes for the punkahs was the origin of the whole mischief. Had the cracks in the roof existed at the time, it can hardly be imagined that orders could have been issued to cut away the only props of the superstructure. The effect of such an improvident order was however fully represented at the time by Lieut. MALLOCK, Major H. being then in England.

It is probable that the chief engineer relied upon his experience of the firm tenacity of the materials: that he had good reason to do so in many respects is proved by the fact recorded in the report, that the semi vault stood firmly when the keystone was knocked out, and was with difficulty broken away piecemeal.

Hence it appears, that after all, the roof might have stood with perfect safety had the punkah holes been refilled with care, and the side-vault been braced together with light iron rods, as in the well known *Musée des Arts et Metiers* at Paris. The continuity of the main arch from the crown of the upper vault, through the flying buttresses to the ground, does not appear to have been broken; and if so, the opening or crack was of little consequence. Yet in face of all the above facts, the restoration of the vault was interdicted, and in lieu of a solid "vaulted roof embracing the highest branches of constructive science, after the manner and principles pursued by freemasons in the beautiful gothic edifices of Europe," it was resolved to descend to an imitation in wood-work with a flat roof above.

Though of minor importance and beauty, the wooden roof is well spoken of in the Report of the Committee of Survey: "The groined roof of the nave is, we believe, the first work of the kind ever attempted in this country, and involving as it does the practical application of some of the most difficult principles of constructive carpentry, the successful completion of such a work under all the difficulties attendant on the employment of native carpenters, who had to be instructed in every stage of the work, is highly creditable to the skill and science of the executive officer, Major HUTCHINSON."

Before closing these preliminary remarks, we would fain notice the painted glass windows of the west and east ends of the nave. They are decidedly lions in our town, admirable specimens of rich transparent colouring, not frittered in small fragments, but in the new style, of colours burnt in on large panes of 24 by 16 inches.

The design of St. PETER receiving the keys is from RAPHAEL'S Cartoon; MOSES and AARON are on either side, and the four Evangelists

fill the compartments below. The Faith, Hope, and Charity of the west windows are taken from the designs of Sir JOSHUA REYNOLDS in New Church, Oxford.

From the great size of the panes of thin glass the difficulty of repairing any of them, if broken, will easily be understood. Yet by an accident, two panes were broken in putting up. The head and neck of Hope was smashed to atoms by the falling of a bambu! Although it is hard to excuse the occurrence of any accident where precautions should have rendered it impossible, we cannot but praise the ingenuity with which it was repaired, so that the damage is not perceptible. The fragments were united together with a transparent varnish on another pane of colourless glass. The only question is as to the durability of the cement; we should fear it would grow brown by age and exposure.

Report on the Demolition of the Vaulted Roofs of St. Peter's Church.

“ A continuous and perfect equilibrium of the several parts of a building, and the concentration of all the forces, whether vertical or lateral, on a few principal supports, which for the sake of lightness, elegance and economy, are calculated to sustain no more than their allotted pressure, being *fundamental* principles in Gothic architecture; the demolition of such a structure (more especially if the equilibrium has been destroyed by the weakening of those supports) must at any time, even with the aid of powerful means, be considered an undertaking of much difficulty and danger; but in this country, with the assistance of native workmen alone, it becomes a duty demanding the utmost vigilance and attention; consequently in the removal of the vaulted roofs of St. Peter's Church, it became of primary importance to ascertain, with precision, the extent and character of the existing derangement of equilibrium, as a correct basis for calculation and design, in the operations to be pursued. With this view, a particular and most minute inspection of all the several parts of the edifice was made, of which the following was the result :

Foundations.—With regard to the foundations, it was ascertained, that the sinking, which had taken place from the nature of the alluvial soil, was exceedingly small* ; any tendency there might have been to sinking in the main pillars having been counteracted by the heavy reversed arches extending under the basement from pillar to pillar.

* The sinking of the pillars most injured by the punkah beams not exceeding $\frac{3}{8}$ th of an inch, which was as little as could be expected from a general settlement in a brick building, and by no means capable of affecting the equilibrium.

Vaulted roofs of side arches and pillars.—The vaulted roofs of the side aisles were found in a most dilapidated state, as likewise the main pillars at the points d'appui of the springing of the ribs, upon which rested the load of the side vaults. Upon the removal of the punkah beams (*r**) shewn in the accompanying section, (which had never been removed by any Committee) it was at once evident that the principles upon which the equilibrium and consequent stability of the side vaults and pillars depended, (and according to which they had originally been constructed,) were entirely destroyed; viz. 1st, the thickness of butment inwards, originally given to the main pillars, had been reduced in the direct line of thrust from 4 to 2 feet, by the perforation of large holes, for the insertion of beams upon which to suspend punkahs; 2nd, the adhesive continuity of the cemented materials (upon which the stability of pillars composed of brick and mortar so entirely depend) had been completely disturbed in the vicinity of the holes, from the blows of the iron instruments by which they had been made; 3rd, the springing of the main ribs, upon which the side vaults rested, had been wholly cut away on either side as exhibited at (*ss*), by which the vaults, *deprived of their supporting points*, sunk down both in haunch and vertex from their original position, thereby greatly increasing the force with which they pressed against the main pillars†; 4th, the main pillars being so greatly weakened by the perforation of the holes, and the disturbance of the cemented material, yielded inwardly‡ to the extent of $4\frac{1}{2}$ inches from the perpendicular, and became cracked entirely across; the parts marked (*tt*) splitting off from some of them. Thus all equilibrium was inevitably destroyed.

Vault of the nave, flying buttresses, cleristery walls, &c.—The above facts being established, the examination was carefully extended to the vault of the nave, the flying buttresses, the external and cleristery walls and towers: but with the exception of some cracks in the flying

	Ton.	Cwt.
* Weighing in each aisle,	1	3
Ditto Nave,	2	6

independently of the weight of the punkahs.

† The exact estimation of their increased force is a question of much difficulty, from its being connected with circumstances not within the reach of calculation, viz. the amount of injury accruing to the arch and pillar by the penetration of the rain into the spandrils and through the arch; also the amount of pressure from the sinking of the abutment of the cleristery walls, which rested in part on the arch: but that it must have been very great will be evident to every one acquainted with the rules and principles of construction.

‡ A slight deflexion of the pillars inwardly had been observed before the punkah beams were inserted. This deflexion, Sir CHRISTOPHER WREN states, is to be observed in all the Gothic Cathedrals in Europe, from which it would appear to be a circumstance incidental to this style of Architecture; but that it is not productive of any important derangement of equilibrium, is fully proved by the great durability of the Gothic structures in Europe.

buttresses, owing to the sinking of the side vaults, the whole was found in such good condition, as to remove any apprehension as to the firmness and stability of the main vault, &c. which being well supported by the flying buttresses, and those of the outer walls, no external shores were judged necessary; and as in its construction it was wholly independent of the side vaults, it was concluded, that notwithstanding the shocks it might be expected to receive from their demolition, yet that they might, when properly secured, be proceeded with in perfect safety, without any fear of danger arising thereby to the main vault. Accordingly, the only point which demanded immediate attention was the counteraction of the imminent danger to be apprehended, from the further sinking and spreading of the side vaults, by which, the main pillars in their shattered condition were liable to be forced inwardly, and thereby to entail the consequent and sudden downfall of the entire building. As this danger could only be prevented by the construction of such massive shores on the nave side, which should be able to resist every power that could possibly be exerted by the spreading of the side vaults, the following plan of shoring, preparatory to the removal of the side vaults, was adopted, and pursued with success.

Mode of shoring.—A solid bed of masonry (*a*) was laid for the firm support of the foundation beam (*b*), upon the extremities of which were fixed in mortises the uprights (*cc*); these were hollowed out to fit closely to the main pillars, their base or lower ends being enlarged and strengthened by the additional blocks (*gg*) to which they were firmly joggled, and bolted, in the manner shewn.

The straining beam (*d*) being then fixed at one end in the upright (on a line with the shattered part of the pillars and strain of the side aisles) by a semicircular tenon working in a similar mortice, the other end cut to a tenon with a slight angle, was by means of three jack screws (as shewn in the distance, forced up a smooth inclined mortise well greased, cut in the opposite upright, and thus brought into a horizontal position. The shores or struts (*ee*), let in obliquely upon the foundation beam (*b*), were then fixed in the mortises cut in the uprights, and straining beam (*d*), and firmly wedged up into their places and secured by the footsil (*f*); thus, the thrust of one aisle was brought into play against the thrust of the other, and further spreading of the side vaults effectually prevented.

Centres for supporting the roofs of the side aisles.—The above work having with great care and labour been accomplished, four strong centres or framings were next constructed, as shewn in *fig. 2*; which when put together, were, by means of wedges underneath, brought firmly up to the masonry of the vault; and thus securely supported, the

work people were enabled by means of crow-bars and pick-axes to commence the demolition of the side roofs without any apprehension of danger. These frames being made movable, the expence of centring up the entire side vaults was avoided. The vaulted roofs of the aisles were thus safely removed, without the slightest injury arising to the centre roof of the nave, thereby confirming the correctness of the opinion formerly advanced that no danger would arise to it. Accordingly measures were now taken for the removal of the main vault, together with the flying buttresses and cleristery walls. The erection of any external shores was still considered wholly unnecessary, but from the great height of the nave (46 feet), it became indispensable to secure the work people from all probability of danger, during the progress of demolition, by any portion of the vault falling inwardly, when the vertex or keying should be cut away; but as the construction of a frame-work of sufficient strength underneath the vault could not have been executed without incurring considerable expence, the following plan was devised and put into execution.

Mode of removing the great vault of the nave.—The upper pinnacles and battlements of the north and south cleristery walls were removed, and a planking laid upon the top of the walls, which admitted of a platform (*k*), fig. 3, placed across the roof being easily slid along its whole length. This platform, in order to give perfect security to the work people, in the event of any part underneath giving way, was suspended by ropes from the four towers, as shewn in the section; and upon this the work people were enabled to commence the demolition of the roof with perfect confidence; but so firm was the masonry found to be, that they soon got off on to the roof itself, although entirely unsupported from below, and the continuity of the arch was destroyed by cutting from the vertex downwards, thus giving the most unequivocal proof of its exceeding firmness and stability. In this manner the entire roof was destroyed; after which the flying buttresses being cut at their two extremities, were allowed to fall inwardly; and finally the cleristery walls were brought down to a level with the shattered parts of the columns. Having thus briefly shewn the state in which the foundations, roofs, and pillars were found, after a most careful examination, and the plan pursued in the removal of the roofs, abundant evidence has been furnished of the ultimate cause which destroyed the safety of the building, and it can only be a matter of surprise, that an edifice, constructed of brick upon the principles of Gothic architecture, should (after the main supports of the side aisles had been cut away, and the pillars reduced to *half* their original strength), have so long resisted the fatal injury committed; the punkah beams having been put up in 1827.”

G. HUTCHINSON, *Major, Engineers.*

II.—Statistical, Agricultural, and Revenue Return of Muthra District, made up to 1st October, 1835. By Capt. R. WROUGHTON, Rev. Surveyor.

STATISTICAL.

Number of Tahseeldarees.	Designation of Tahseeldaree, or Native Collectorship.	Houses.		Total Houses.		Population.				Total Population.	Chopals.	Utuls.	Munduls.	Durgahs.	Carts.	Milk and grazing Cattle.	Beasts of burden, including Elephants, Camels, Horses, Mules, Asses, and Bullocks.								
		Pukka.	Kucha.	Hindoos.		Muhammedans.		Males.	Females.																
				Males.	Females.	Males.	Females.																		
1	Julleysur,.....	217	14522	14739	52359	37001	4567	3325	247	24	21	14	155	23807	1646										
2	Maat,.....	1	1644	1645	5723	3838	242	158	9661	62	7	0	4	2321	71										
		2	1366	1368	5104	3642	62	75	8883	56	7	0	1	0	2481	89									
3	Nooh Jheel,.....	1	7499	7510	21636	16542	1120	930	40228	74	60	2	4	79	15996	282									
		1	4888	4889	15768	11379	763	1136	29246	210	15	10	1	35	11024	745									
4	Muhabun,.....	377	11030	11407	32726	22984	2077	1539	59326	237	56	28	9	61	13085	1757									
		353	7510	7863	17977	13280	2507	1876	35640	215	103	89	45	213	9355	470									
5	Kosce,.....	25	7247	7272	17076	11734	1586	939	31315	194	110	130	45	567	10795	1954									
		25	3263	3288	7634	5576	1114	1516	15840	62	39	19	16	39	2433	98									
6	Suhar,.....	21	2959	2980	7966	5112	308	198	13584	85	46	17	7	309	4336	281									
		0	192	192	3601	2928	99	99	6702	110	25	4	2	92	2788	130									
7	Areeng,.....	237	1880	2117	5822	4034	681	324	10861	86	17	66	1	15	2947	131									
		1	1161	1162	3289	2301	279	152	6021	32	13	6	0	49	2464	467									
8	Saidabad,.....	105	5049	9154	30648	23678	2099	1816	58241	180	15	5	7	241	7975	795									
		0	2302	2302	8072	5815	601	431	14919	54	5	2	1	2	1631	232									
9	Hussoor Tahseel,...	8906	7320	16226	45947	37071	3952	3586	90556	130	50	251	32	278	7288	1255									
		10282	83832	94114	281348	206915	22845	17287	528395	1984	592	680	185	2139	120726	10101									
The above gives an average to each square mile on total superficial area of district, amounting to 1587 square miles, of		Houses.		Total Houses.		Population.				Chopals.		Munduls.		Carts.		Milk and grazing Cattle.									
		Pukka.		Kucha.		Hindoos.		Muhammedans.		Males.		Females.		Males.		Females.									
		6-48		5-29		206915		22845		22845		17287		1-2		0-37		0-11		1-3		76		6-55	
		332-9																							

Abstract.—The average number of houses per village is 60-91=persons to each house 5-61=Hindoos to Muhammedans, as 12 to 1=males to females, as 19 to 14. Bullocks to each plough 2-05: Cultivation to each plough, 18 acres, 0 roods, 10 poles.

AGRICULTURAL DETAIL.

Number of Tuhseeldares.	Designation of Tuhseeldaree, or Native Collectorship.	Number of Villages.			Total Number Villages.	Land-holders.		Total Land Holders.	Cultivators.		Total Cultivators.	Ploughs.		Draft Cattle.		Wells.		Total Wells.	
		Uslee.	Dakie.	Muatee.		Numberdars.	Putteedars.		Koodkasht.	Pykasht.		Koodkasht.	Pykasht.	Total Ploughs.	Koodkasht.	Pykasht.	Pukka.		Kucha.
1	Julleysur, Awa Missir Tal, Soneyee,	286	79	0	372	342	174	516	6304	205	6509	11512	213	11725	24045	426	2212	3773	5985
2	Maat, Rayuh,	19½	19½	5	26	115	224	339	926	13	939	1071	13	1084	2197	26	219	530	749
3	Nooh Jheel, Maat,	44	15	3	62	289	1243	1532	1548	225	1773	1019	97	1116	2055	200	274	356	630
4	Muhabun, Nooh Jheel,	96	19	0	115	268	387	655	2413	371	2784	2879	386	3265	5968	765	461	1187	1648
5	Kosee, Muhabun,	88	12	15	115	423	1937	2360	2615	906	3521	4742	260	5002	9569	520	829	2461	3293
6	Suhar, Kosee,	63	36	0	99	469	3970	4439	1805	993	2804	3369	363	3732	6942	16	628	357	985
	Sheergudh, Suhar,	28	6	6	40	119	580	699	4667	4935	9602	3819	189	4005	7658	382	366	518	884
	Areeng, Sheergudh,	21	4	3	28	164	591	755	1801	716	2520	802	99	901	1607	199	266	213	479
7	Sonk-Tal, Areeng,	15	118	3	136	229	2241	2470	1871	1065	2936	1332	289	1624	2874	561	155	197	352
	Gowurdhan Tal, Sonsa Tal,	12	1	3	16	93	304	397	1912	440	1352	634	66	700	1312	0	2591	55	202
	Sonsa Tal, Gowurdhan Tal,	15	4	2	21	112	575	687	857	480	1337	721	133	854	1467	266	67	149	216
8	Saidabad, Sonsa Tal,	93	203	0	266	467	2083	2550	2324	879	3203	5037	899	5936	10268	1710	471	5643	6114
9	Husoor Tuhseel, Saidabad,	24	15	0	39	110	226	336	619	124	743	1416	115	1531	2799	228	69	1199	1268
	Muthra,	32	19	19	70	174	400	574	1456	658	2114	1631	150	1781	3262	300	798	151	957
9		918½	550½	76	1545	3849	18772	22621	31439	12599	44038	44905	3412	48317	92401	5882	7569	17680	25249

The above gives an average to each square mile on total superficial area of district, amounting to 1587 square miles, of

Wells.
Pukka. 476
Kucha. 1114

Draft Cattle, Koodkasht. 5822
Pykasht. 22

Plough, Koodkasht. 2829
Pykasht. 22

Cultivators, Koodkasht. 1981
Pykasht. 81

Land-holders. 1425
Numberdars. 25
Putteedars. 1400

Total Land Holders. 22621
Koodkasht. 1456
Pykasht. 658

Total Cultivators. 44038
Koodkasht. 2114
Pykasht. 658

Total Ploughs. 48317
Koodkasht. 1631
Pykasht. 150

Draft Cattle. 92401
Koodkasht. 3262
Pykasht. 300

Total Draft Cattle. 99283
Koodkasht. 3262
Pykasht. 300

Wells. 7569
Pukka. 476
Kucha. 1114

REVENUE.

Number of Tahseeldares.	Designation of Tahseeldare, or Native Collectorship.	Pergannahs and Talukas appertaining to each Tahseeldare.	Productive and unproductive Return.										Average per Acre of 4340 square yards on present Jumna.		
			Total Cultivation.		Total Malguzaree, e. i. cultivated, culturable, and fallow.		Barren, waste, or otherwise unproductive.		Total Area.		Amount annual Revenue	On total Area.	On total Malguzaree.	On Cultiva- tion.	
			Acres.	Beehahs of 2736½ S. Y.	Acres.	Beehahs of 2736½ S. Y.	Acres.	Beehahs of 2736½ S. Y.	Acres.	Beehahs of 2736½ S. Y.	Ruppes.	Rs. As. P.	Rs. As. P.	Rs. As. P.	
1	Julleysur,.....	Awa Missir Tal, Sonejee,	143688½	252183	155657½	273133	32533½	57026	188191	330159	318362	1 11 0	2 1 11	2 3 5	
2	Maat,.....	Kayath,	17825	31300	19349	33974	888	1561	20237	35535	52198	2 9 3	2 11 1	2 14 10	
3	Nooh-Jheel,.....	Maat,	54872	96359	56281	98333	12105	21265	68387	120098	22475	1 12 5	1 13 2	1 14 9	
4	Muhabub,.....	Nooh-Jheel,	60411	106080	62319	109434	14335	25150	76654	134624	150391	1 11 2	2 1 5	2 2 6	
5	Kosee,	Muhabub,	76098	133635	82763	145296	10570	18513	93333	163509	167896	1 12 9	2 0 5	2 3 3	
6	Suhar,	Kosee,	82402	144697	89375	156909	8064	14143	97439	171052	153412	1 9 2	1 11 5	1 13 9	
		Suhar,	93061	163319	103473	181668	11779	20659	115252	202327	109048	0 15 1	1 0 9	1 2 8	
		Sheergauth,	29433	51687	35972	68417	4586	8045	43558	76462	32265	0 11 10	0 13 2	1 1 6	
		Areeeng,	38647	67830	44522	78168	4622	8108	49144	86276	32058	0 12 4	0 13 8	0 15 9	
7	Areeeng,	Sonk Tal,	33323	58514	36997	64960	2793	4898	39790	69558	51400	1 4 8	1 6 2	1 8 8	
		Gowurdhan Tal,	15812	27769	17760	31181	2010	3523	19770	34704	19683	0 15 11	1 1 8	1 3 11	
		Sonsa Tal,	17020	29887	18843	33078	1262	2213	20105	35391	27379	1 5 9	1 7 2	1 9 8	
8	Saidabad,	Saidabad,	77613	136238	83084	145821	10934	19169	94018	164990	230303	2 7 11	2 12 4	2 15 5	
		Suhpoo,	18657	32737	1301	34570	1301	2268	21010	36338	57214	2 11 6	2 14 10	3 1 0	
9	Hussoor Tulareel,	Muthra,	37754	66295	42861	75240	10406	18255	53267	93495	30101	0 9 0	0 11 2	0 12 9	
9			811121	1424139	867578½	1558094	128674½	225511	1016153	1783605	1557280	1 8 7	1 11 5	1 13 9	

Revenue.

Sa. Rs. As. Ps. Co. Rs. As. Ps.
981 4 4 = 1046 10 1½

Superficial area of district excluding space occupied by Jumna river, 1587 square miles.

The above gives an average to each square mile on total superficial area of district, amounting to 1587 square miles, of

IV.—*Notes on the State of the Arts of Cotton Spinning, Weaving, Printing, and Dyeing in Nepál.* By Dr. A. CAMPBELL, attached to the Residency.

[Read at the Meeting of the 2nd December.]

It may safely be asserted, that the arts generally in Nepál have not hitherto arrived at any degree of advancement, beyond that attained in the plains of India. In regard of those which have attained to considerable perfection below, Nepál is extremely backward in the progress made by her people, nor do I know of any in which the Nipálese can be said to excel their Hindu brethren of India, except the useful one of agriculture, to which may be added, perhaps, brick and tile making; and, in more recent days, the manufacture of flint-lock fire arms.

In the art of weaving, it is universally admitted, that neither the Egyptians of the olden, nor the nations of Europe in the modern, time have equalled, or do excel, the Hindus of Dacca and Benares; while this art in Nipál, is still at the very lowest possible grade of advancement. It is matter of curiosity, as well as of astonishment, that although the Newárs claim, and not improbably hold, a title to considerable antiquity as a united people*, and have made great advances in husbandry, some progress in literature and architecture, they have not got up to this day, beyond the threshold of civilization in that art, which, among the rudest nations, has been found in a state of much efficiency†.

Some one of the Roman philosophers, I have read, gave credit to SEMIRAMIS, for the invention of weaving cotton; and MINERVA herself, was, I believe, an enthusiast, and proficient in the labour of the loom. Our Nipálese queens of the present day are too proud of their Rajput, or “Moon-born lineage‡,” to indulge in the practice of the useful arts. And the goddesses, although abundant as the grains of sand on the sea shore, are now but images of the olden personifications; consequently, the weaving art has not descended to the modern representatives of the above-named ladies; but still cleaving to the sex, as a pastime, or profession, we find it confined solely to the women, among the Newárs. The men toil at other labours, but they weave not, “neither do they spin.” Weaving is scarcely a trade in the valley of

* See Mr. HOBSON'S *Legends of the Origin of this Tribe* in the *Asiatic Journal*.

† The Mexicans, at the time of the conquest of their country by the Spaniards, had manufactures of cotton cloth in considerable perfection—“of cotton they made large webs, and as delicate and fine as those of Holland.”

‡ Chandra Vansa.

Nepál, for all the Newár women, of the poorer classes, (and there are scarcely any others now,) weave the cotton cloths required for the consumption of themselves and families.

These fabrics of domestic manufacture are all of cotton, and of the coarsest and most inelegant description. The cotton is grown in abundance throughout the hottest valleys of the Nipálese hills, and in the Tarai skirting their plainward face. It is brought on men's shoulders*, as picked, with the seeds in it, to the different towns of the valley, where it is exchanged to shop-keepers, for money, or other produce, as the case may be; and thus each family, as its means will admit of, purchases, from time to time, so many pounds of the raw material as suffices for the employment at the cleaning machine and spinning wheel of the mother and her daughters.

The cotton is separated from the seeds by the women, either with the fingers, or by the help of a most primitive contrivance, of the following description, and called *Keko*. Two rollers of wood, the thickness of a walking stick, and close together, are placed in an upright frame, and made to revolve on one another by means of a handle attached (through one side of the frame) to the lower of them. The operator, sitting on the ground, places the frame between her feet, steadying it with her toes, and applies small portions of cotton to the spaces between the rollers with her left hand, while she plies the revolving handle with the right: in this manner the cotton is drawn between the rollers; the seeds, being too large for the interspace, are separated and left behind.

The spinning is equally primitive, but its mode not easily described. The machine† is small, and easily portable, even by a child of six years old; it is not raised from the ground by means of legs, as is the domestic one of the Scottish Highlanders, and Northern Irish, (the ones I am best acquainted with;) nor is the wheel set in motion by the pressure of the foot on a board connected by a thong of leather, with a lever or cramp fixed to its axle, as is common in turning grind-stones, or turning lathe-wheels; but, the spinner, as in the cotton-cleaning process, sits on the ground, with one hand turning

* Man is the only animal of burden employed in the valley of Nepál, as well as the interior of her hills—a circumstance of itself strongly pointing out, how short a way the inhabitants have advanced beyond sheer barbarism. The uneven surface of their country is scarcely sufficient to save them from this imputation. The rulers of the land drive English carriages, while the transport of every article in their dominions is made on men and women's backs—a good specimen of eastern pomp, associated with its common accompaniment, hard-worked poverty.

† Called *Yeáú* by the Newárs.

the wheel by means of a handle, and with the other, drawing out the cotton into thread.

An iron rod is attached by means of a string to the wheel, and revolves in company with it, on which the thread, as spun, is collected, and in this manner, women and girls of all ages employ themselves, when not assisting at sowing or reaping, either in front of their dwellings, in the towns, or at the road-side, as may best suit their convenience*. The spinning wheel may be best described by saying, that it is but the ancient distaff, improved by the addition of a wheel for keeping it in motion; for the sharp-pointed iron rod, to the extremity of which the cotton is applied, and by which it is spun into thread, is precisely the spike of the distaff, and like its prototype, serves the double purpose of a bobbin on which the thread is accumulated as spun. The spinner turns the wheel from left to right while forming the thread, and to allow the portion spun to be accumulated on the iron rod, gives the wheel a small turn in the opposite direction, at the same time, lowering her left hand, so as to permit the winding-up of the thread. This necessary interruption in the spinning process, is a great drawback on the time of the spinner, and renders the distaff wheel very inferior, when compared to the common one of Europe. When tending cattle, or watching their ripe crops, the females generally wile away the time, and assist in replenishing the family wardrobe by spinning or weaving in the open air.

Having thus imperfectly spun the yarn, we proceed naturally to the warping and weaving of it, both of which processes are performed exclusively by women, with the very simplest and rudest machinery, equalled by the coarsest and most ungainly produce. The ordinary breadth of the Nipál cotton cloths is about half a yard, and rarely exceeds two feet. The average length of the webs is from 6 to 12 and 14 yards, and the texture of the finest is not superior to the *dosúti* cloth of Hindustán, used for house canopies (*chhats*) and floor cloths.

When a *Newár* woman has spun a sufficient quantity of thread for the warp of a web, she winds it off the iron rod, on which it has been spun, into (or, on) large bobbins of about nine inches long, and fit to hold three or four pounds of thread.

With these large bobbins, and a few reeds, about three feet long, she repairs to the nearest grassy spot without her viilage, or to the side of the causeway, if unpaved, and there, sticking the reeds in the ground,

* The universality of the spinning wheel may be readily credited, on the announcement of a custom which enjoins every *Newár* parent to present his newly married daughter with a *Yeáú* and *Keko* in addition to her dowry.

(a few feet asunder,) to the length of her purposed web, she has prepared the only warping frame known throughout these regions.

Tying the thread to the reed on her extreme right, she moves rapidly up and down along the line, passing the thread (as it comes off the bobbin, revolving on a shaft passed through its axle, and held in her right hand), on alternate sides of each reed, until the "warp is laid."

The dexterity acquired by the women, in warping, is considerable, and the quickness with which they entwine the thread, with the warping reeds, is remarkable; and apparently, it is executed with little trouble. I have often seen those women moving up and down, and laying the warp regularly on the frame, at a fast walk, and all the while talking and laughing with the persons present, and assisting them in the performance of their task.

Having "laid the warp," the reeds (or rods of wood, as the case may be), are pulled out of the ground, and the warp, frame and all, is rolled up and carried home. All the cloths made in the valley are of uncoloured thread, which renders the warping a much easier affair than when striped webs are to be laid down.

When leisure offers for weaving the web, the women on a sunshining day spread out the warp (the warping sticks still in it) and apply with a brush, made of a suitable kind of grass, the paste necessary for smoothing the thread preparatory to putting the web in the loom.

The mode of weaving does not essentially differ from that practised in the uncivilized portions of our own country with which I am acquainted. The weaver sitting on a bench, with the loom in front of her, plies the shuttle alternately with either hand, pulling forward the swinging apparatus for laying the woof thread, close to its predecessor, and plies the treddles with her feet*. The weaving is carried on under a shed, within a small verandah, or in the house; and as the roofs are generally low, the treddles are made to play in a hollow dug in the earthen floor under the loom. The loom is made of the commonest materials, and very clumsily put together, and is altogether of a piece with the poor state of the weaving art. Lest it should be thought that it is intended to connect the wretched produce of the Nepál looms, with the rudeness of the machinery, as inevitable cause and

* This portion of the loom is extremely rude and primitive; instead of foot-boards moving on a fixed point, to be depressed alternately, so as to make one layer of the warp threads cross the other, and thus incorporate the woof with it, we find two small buttons suspended from the lower margin of the netting, which the weaver seizes between her great and first toe, alternately depressing each foot as the woof thread is delivered by the shuttle.

effect, I may mention that the Nepál loom, and the arrangements of the weaver, are superior in some respects to those of the unrivalled manufactures of the Dacca muslin. MILL's account of the Hindu loom corroborates this; he says, "It consists of little else than a few sticks or pieces of wood, nearly in the state in which nature produced them, connected together by the rudest contrivances. There is not so much as an expedient for rolling up the warp." The weaver is therefore obliged to work in the open air, as his house could not contain him and his web at full length; "and every return of inclement weather interrupts him." The Nepál weaver rolls up the warp on its original frame, and ties it to a peg driven in the ground close to her feet, while a cross beam in front of her receives the web as it is woven*.

The Thibet woollen cloths are of infinitely superior workmanship to the cotton ones of Nepál, and indeed, are of very fine make and material, although deficient in width. It is therefore evident that in the earliest of the arts, one which must have been practised by all human societies, so soon as leaves and skins were deemed unfitting clothing, the Nipálese have been left far behind, by the Hindus of India on one hand, and by the Tartars of Bhote on the other.

Dyeing and printing come naturally enough to notice, after spinning and weaving; and the advancement made in these arts has kept an even pace with that in the former. As dyesters the Newárs are miserable artists; they cannot at this day dye a decent blue, although furnished with indigo for the purpose.

A dirty red (from madder) and a light fading green, are the colours most commonly dyed by them; but they are not *fast* and durable, nor elegant when fresh. The only tolerably good dyeing done in Nepál, is by some Cashmírís, and people from the plains.

The coarse cloths of the country are printed, in imitation of the chintzes of India and Europe, and are much worn by all classes of females, who cannot afford to purchase better stuffs; but the imitations are very badly executed, and the colours not durable. The best Nipálese chintz is printed and dyed at Bhatgaon, in the valley; and in the hills east of the valley, at a place called Dunkutuah. In the small valley of Punouti too, about 24 miles east of Kathmandu, this trade is carried to some extent, and with nearly similar success.

* The different parts of the loom are not connected so as to form one complete machine. For instance, the swinging beam and netting are generally suspended from the roof of the house.

In the commonest European loom, the bench on which the weaver sits, the beam on which the cloth is received, as well as that on which the warp is rolled, together with the swinging beam and netting, are all joined together.

A piece of best Parbattia chintz $5\frac{1}{2}$ yards long, sufficient to make an entire dress for a woman, costs at Kathmandu 1-8-0 Nipálese rupees*.

The subjoined list of the cotton piece goods manufactured in the valley and neighbouring hills, of which specimens are now presented, may not be useless to the public, while it will tend in some degree to give practical illustration to the above remarks. As a mode of attempting to estimate the real value of these products, and to assist in throwing light on the condition of the people who make and use them, the value of money, in regard to the staff of life, may be conveniently recorded †, especially as in Népál, as well as India, the craftsman does not, generally speaking, earn any thing in addition to the common wages of agricultural labour, or in other words, little more than suffices to fill his belly, and that of a wife and children, with plain rice, and a few spices, and to buy the raw cotton, for the manufacture of his, and their coarse clothing. Models of the spinning wheel, and cotton cleaning machine, accompany the specimens of cloth.

List of the principal cotton piece goods Manufactured in Népál proper, and throughout the Hills; to which is added a notice of the Bhungara, or Canvas made from the inner bark of trees, and the few coarse woollens of the neighbouring hills ‡.

*Names by which
known in the Bazar.*

Remarks.

1. *Changa*.—Manufactured in almost every Newár's house throughout the valley, and generally in the hills. Is coarse, hard and thin in texture. Is for the most part in webs of 10, 12, to 14 yards long, and 18 inches broad, and ranges in the Kathmandu bazar, from one rupee to 1-4-0 and 1-8-0 per piece.

* A Nipálese rupee equivalent to $12\frac{1}{2}$ annas of Company's currency.

† A full grown labouring man requires for a day's good food, $1\frac{1}{2}$ mannas of rice, and his wife, with (say as an average) three children, $1\frac{1}{2}$ mannas more, or in all three mannas.

The present price (November 1835) is 26 mannas, or nearly nine days' food per current rupee; to this, add salt, spices, and other condiments, worth one rupee more, and it will be seen that the wages of labour such as a man can live on in tolerable comfort, must be about four current rupees per month, and this without any allowance for clothing, house or luxuries.

The lowest class of laborers, and artizans, in some parts of the valley, and throughout a great portion of the hills, cannot come at rice, as their ordinary food; but must be content with the coarser grains, such as murwa, bajra, kodu and Indian corn. Two current rupees per month suffice for their subsistence, and is about the price of their labour.

‡ The specimens here described are deposited in the Society's museum.

2. *Kadi*.—Thick, coarse and strong; manufactured in considerable quantity in the valley of Noakot, as well as in the great valley and throughout the hills: is much worn by the cultivators of all tribes, Parbattiahs, and Newárs. Comes to market generally in pieces of $6\frac{1}{2}$ yards long, 16 or 18 inches broad, and averages at Kathmandu 12 annas to one rupee per piece. Wears long and well; like the above, is sold unbleached.
3. *Purabi Chint*.—Is an imitation of Indian Chintz, manufactured at Dunkutuah and other places in the eastern hills, generally coloured, black and red, in a small striped pattern; coarse and heavy. Is much worn by the poorer Parbattiahs, and Newárs (women). Comes to Kathmandu in pieces of five yards long, and less than two feet broad, and may be generally bought for 14 annas or one rupee per piece.
4. *Múmi Chint*.—Also manufactured at Dunkutuah and to the eastward; is very like the above; worn by the Parbattiah and Newár women, made into chúlís (boddice) and sárís. A piece of six yards long and 18 inches broad, costs in Kathmandu about one rupee.
5. *Banárasí Chint*.—Manufactured at Bhatgaon in the valley, and named from its being an imitation of the Indian Chintzes; is of different colours and patterns, not so coarse and heavy as the other kinds, but thin and flimsy. Is used as lining for jackets, and for women's dresses. A piece six yards long and half a yard broad, costs in Kathmandu about one rupee or up to 1-8-0.
6. *Kalú Chint*.—Manufactured chiefly in the hills west of Kathmandu; is coarse, heavy, very rudely dyed and printed, but the broadest of the Nipálese fabrics. A piece eight yards long by $2\frac{1}{2}$ feet wide, costs about one rupee eight annas.
7. *Durkeah Chint*.—Manufactured principally at Pokra and Bútwal; very coarse and heavy, but has a better width than the Chintzes of the valley: used for jacket linings, and women's dresses; six yards long and two feet broad; costs in Kathmandu about one rupee eight annas.
8. *Bútedár Chint*.—From its spotted pattern it takes its name; is a favorite one of the Bhatgaon Chintzes. A piece of $5\frac{1}{2}$ yards long and half a yard wide, costs about one rupee eight annas.
9. *Hara Chint*.—Comes almost exclusively from the small valley of Bunapa, 20 miles east of Kathmandu; coarse and hard like the rest.
10. *Párabí Kadi*.—Manufactured in the eastern hills, is broader, and somewhat finer than the Noakote article (No. 2.); a good deal of this article is exported from Nepál to Bhote. A piece of 14 yards long and $2\frac{1}{2}$ feet wide, costs at present in Kathmandu three rupees.
11. *Kassa*.—Nipálese imitation of the Indian mulmul or common gauze, a wretched manufacture. Is made in large quantities at Bhatgaon, and generally by the Newárs throughout the valley. Is used for making turbans; a piece of eight yards long and six inches wide is sufficient for a pagri, and costs generally four annas. Worn by the poorer Parbattiahs, and some Newárs, for the Asiatic turban is not general among this latter race, a small conical skull cap being the most common head-dress among them.
12. *Bhangára*.—A very coarse and strong sackcloth or canvas, manufactured from the inner bark of trees, by the people of the hills, and much used in

the valley of Nepál for making grain-bags and sacks, for the transport of merchandize. The poorer people of the hills, who subsist chi fly by wood-cutting and carrying, make this cloth in their houses and wear it. I cannot at present ascertain the description of trees whose bark is converted into this clothing, nor the detailed process employed in making it into thread. The hill people say that several different trees furnish the appropriate bark, and that it is necessary to heat and pound it, as for paper making*, previous to spinning it into thread. The cloth is exceedingly strong and durable, and is said to stand wet for a long time without being rotted, or injured in texture. It is brought to Kathmandu, in wehs of about five yards long, and 12 inches broad, which costs on an average eight annas.

13. *Rhari*.—A coarse kind of woollen blanket manufactured by the Bhoteahs of the Nepál hills, and worn by them almost exclusively: is brought to Kathmandu in pieces of $7\frac{1}{2}$ yards long, and 14 inches wide, and costs about three rupees. Its texture is very thick and heavy, hut it is admirably suited for the rainy season, to the inclemency of which the burden-bearing, and wood-cutting Bhoteahs, are much exposed. The Newárs do not wear this, nor indeed (as a general practice) any woollen garments. This is also for the most part of domestic manufacture, as every Bhoteah who possesses a few sheep, has a weh or two of it made up annually by his family. To add to the warmth and thickness of the Rhari, it is frequently improved by heating wool into it, which gives it the appearance of felt.
14. *Bhote*.—Has its name from that of the people making and wearing it. The hill countries north of Nyakote and the valley of Nepál, up to the snows, produce this article. It is a thick and soft woollen stuff, half blanket half felt, much warmer and lighter than the rhari, but inferior to it as a protection against rain. A piece seven or eight yards long, by 18 inches wide, costs in Kathmandu about two rupees eight annas.
- P. S. On submitting the above to Mr. HODGSON'S perusal, he informed me of the existence among the Newárs, of some coloured cotton manufactures, overlooked by me in this list. I have procured specimens of them and of an unnoticed plain manufacture, both of which are added; they are as follows:
15. *Putassi*.—So called by the Newárs. It is a strong coarse sort of check, generally blue and white, sometimes red and white; is entirely a domestic manufacture, and very rarely procurable for purchase in the bazar, the women not weaving more of it than suffices for their own wear. Is woven exclusively by the Newár women: a piece $5\frac{1}{2}$ yards long, and $2\frac{1}{2}$ feet wide, costs about $2\frac{1}{2}$ current rupees. There are several varieties of this stuff, as to colour and pattern (some of them being striped instead of checked), but all are coarse and heavy.
16. *Puniká*.—An imitation of the table cloth manufacture of Dinapur, and the variety technically called "Bird's eye." Three or four sorts are manufactured by the Newárs, but all save one are coarse and heavy. It is worn by the better class of Newárs, male and female, and by the Parbattiahs sol-

* See the Nepál paper-making process, as described by Mr. HODGSON in the Journal of the Asiatic Society.



Nisaetus Nipalensis
type of the new Genus *Nisaetus*.

diery occasionally. A web of six yards long by two feet broad, costs three current rupees. The manufacture of this article is confined principally to the larger towns of the valley.

17. *Bhím Poga*.—(Newári.) An ancient manufacture and article of clothing of the Newárs, but not worn by them in the present day. Is wore only by a class of outcasts, and is with difficulty procurable; its only use at present is, to roll the corpse of religious persons in previous to being burned. The warp, is of coarse cotton thread, the woof of soft spun woollen yarn, in addition to which some fine wool is amalgamated with the web in weaving it. Its texture is very soft, and is well calculated for a warm in-door wear; it is too fleecy to be kept out wet. A piece of four feet long by two feet wide, costs two current rupees.

V.—*Summary Description of some New Species of Falconidæ.* By
B. H. HODGSON, Esq.

Genus *Aquila*. Species new. *Aquila Pernigra*. Jetty Eagle, (mihi.)
Habitat, the central and northern regions of *Nepál*.

This species is throughout of a black colour, but less pure below than above, and the tail is transversely marked with four or five broad bands of a paler and brownish hue. The cere and toes are bright yellow. The bill blue, with a black tip; the talons black, and the iris brown. It is a bird of somewhat slender form, and very graceful and powerful flight, possessing all the influential characters of the genus, as now restricted; but distinguished from its type, or *chrysactos*, by a slenderer bill, rather longer toes, and longer and more acute talons. It is two feet five inches from tip of the bill to the end of the tail, and five feet and a half between the wings; and is chiefly remarkable for the extreme inequality of size and acuteness of the talons. The orbits are downy; the sides of the cere clad in short, soft hairs; and the feathers of the hind head and neck are prolonged into a vague crest of narrow composed plumes. The cere is rather large, but not heavy; the bill longer than the head, but slight rather in form. The wings are equal to the tail, with the fourth quill longest, and all the great ones strongly emarginated, remotely from their tips; the tips being inclined a little inwards: tail even, or subrounded.

The tarsi moderate and plumed; toes nude and reticulate, with three or four scales next the talons, which, as already noticed, are very acute, and the inner fore and hind ones of extreme length and curve. The inner fore talon is the largest, then the hind one, next the central, and the outer fore, least.

The nares are obliquely cleft in the cere, and of an irregular oval shape, with the upper margin arched and tumid.

This is a shy bird, which adheres exclusively to the wild and mountainous tracts of the hills. Its body is entirely free from offensive odour and vermin, and its prey chiefly the pheasants of the region it frequents, as well as their eggs. Its weight is about $4\frac{1}{2}$ lbs.

Genus *Haliaeetus*. Species new. *H. Albipes*, (mihi.)

This species is two feet nine inches long, and six feet eight between the tips of the wings. In colour it nearly resembles *Macei*, having the head, neck, and body, pale ruddy brown, darker on the thighs and rump; the scapulars, wings and tail, saturate brown: a large bar of pure white through the centre of the tail: and the cheeks, chin, and throat, hoary. The bill and head are considerably narrower than in the golden eagle, but the bill is fully as long in proportion to the head, and even more so. The toes are longer and less thick than in that species, and the talons rather more curved. In other respects, these members sufficiently resemble those of the type of *Aquila*. But the tarsi are nearly nude: the acropodia, as well as acrotarsia, wholly scaled; and the toes are cleft. The bill is longer than the head, straight towards the base, and at it nearly twice as broad as high. The lateral compression is, in general, moderate, and the ridge acutish; the hook, large; the cutting edges, even. The cere, large, nude, clad only on the sides towards the base with soft hairs, diverging from the fore angle of the eye. Nostrils, forward, sub-basal, obliquely transverse, irregularly oval, simple, and inclined to a curve at the forward extremity. The tarsi are low, thick, and gummy; plumed over the knee, and a little below it. The toes, longish, unequal, stout, cleft to their origins; but the outer *not* versatile. To the front, both tarsi and toes are scaled, as already noted; but the junction of the toes and tarsi, as well as the sides and backs of the latter, are reticulate. The central toe is as long as the tarsi. The talons are long, arched, stout, and moderately acute: the hind one being the largest. All are flat below. The wings are very nearly equal to the tail, and have the fourth quill longest. Most of the great quills are strongly emarginated, high up, on both webs. The tail is of medial length, and square. The hook of the bill and the talons are black; the bill blue; the cere yellow: iris hazel brown, and feet pure white.

This species is generally found on the banks of the larger rivers, near to where they issue into the plains, and it preys on fish.

Genus *Nisactus*, (mihi.)

The birds of this genus are distinguished by wings and tail formed upon the accipitrine model; but their nares are transverse and speculated as in the eagles. Their festooned bills have a form which is osculant between the hawks and buzzards. They have the long slen-

der plumed tarsi of *Limnæetus*, and the long, acute, and unequal talons of the noblest hawks and falcons, to which moreover they assimilate in their manners, adhering exclusively to the wilds, and killing their own prey, which consists of pigeons, jungle fowls, and partridges.

Species *Nipalensis*, mihi. *Habitat*, the lower hills and *Saul* forest.

This species is liable to vary very considerably in colour, and is sometimes found possessed of a drooping egret-like crest of two long, narrow, composed plumes. I have several specimens, procured within the past 10 years; but, as I cannot venture to determine the diversities of appearance with reference to sex and age and season, I shall describe a bird in each of the more striking aspects it presents.

1st. This is the uncrested and paler aspect. The head, the neck, the whole body below, with the basal and interior parts of the plumage above, are white; the wings, back, and tail, brown.

The crown of the head, and the dorsal face of the neck, have a pale fawn-coloured smearing. The cheeks, chin, and throat are immaculate; the head, neck, and body, below marked lengthwise, with narrow lines of saturate brown. The thighs are transversely barred with pale fawn; and the plumes of the tarsi, with the lower tail coverts, are unmarked. Several of the lesser wing coverts are broadly margined with white. The wings and tail have seven cross bars of saturate brown, which are vaguely seen above—clearly on the pale inferior surface. The lining of the wings is white, with here and there a heart-shaped brown mark.

2nd. In this, the darker and crested form, the head and neck are brown, with broad white margins,—a change caused by the expansion of the central streaks of No. 1. The cheeks and chin have a triple longitudinal marking of brown, one line proceeding from the chin down the throat, and one from either side of the gape over the cheeks. The transverse bars of the thighs are darker, being brown rather than rufous, and they are extended over the tarsi and inferior tail coverts. Lastly, from the back part of the head proceed two long, narrow, composed plumes of brown colour, forming a very graceful pendant crest.

In both birds, the bill is blue at the base, black at the tip; the cere, greenish yellow; the iris, golden; the toes yellow, and the nails, black. The largest specimen procured by me is $29\frac{1}{2}$ inches long and 60 wide: the smallest is 25 inches long and $49\frac{1}{2}$ wide. The former weighed 4 lbs., the latter, 2 lbs. 12 oz. The intestines vary in length from 46 to 50 inches. There are two small cæca: the gut is much more capacious above than below. The stomach, though, of course, of the solvent type, has a thickish sub-muscular outer coat, and there are soft ridges along its inner surface.

The following characters of the bill and other members and organs apply equally to the foregone, and to that which will be presently described. The bill is shorter than the head, moderately compressed, scarcely arched from the base, and scarcely straight at it, distinctly festooned, and moderately hooked, with the tip of the lower mandible very slightly truncated.

The cere is moderately sized, and covered on the sides with down and soft hairs, which latter scarcely reach forward to the nares. The nares are almost vertical, ovate, angulated, and smallish. The orbits, clad; the cartilage of the brows, nude and prominent; the eye, rather large; the tarsi, long, slender, and plumed; the toes of medial unequal length and thickness; slenderer and longer than in *Aquila* or in *Buteo*, not so long or so fine as in the noble hawks and falcons, although, as in them, possessed of rough soles and large balls; acropodia, reticulate, with three or four scales next the talons. The outer toe is connected with the central by a membrane: the talons, long, acute, and unequal, as much so as in the noblest of the hawks; the hind talon, largest, and all flat beneath.

The wings and tail are as strong and firm as in the finest of the Falconine race. The tail consists of 12 equal and broad feathers. The wings reach only to its centre. The fifth quill is the longest: but the fourth and sixth are nearly equal to it; the first considerably, the second and third, moderately and equally, graduated up to the longest; first to sixth inclusively emarginate, high up, on the inner web, and second to seventh, on the outer.

Species *Grandis*, (mihi.)

I have been able to procure but one species of this bird, which was taken alive, and lived in confinement upwards of three years. It died in December, in full plumage. It was a male, and answered to the following description. The iris is brown; the cere and toes, yellow; the bill, blue, its tip and the talons, black. Head, neck, body, and wings, saturate brown above, beneath white, stained with rufous; the tail, above, slaty-blue. The cheeks, chin, throat, and breast exhibit on each plume a central broad stripe of dark brown, following the shaft, and margined on either side with rufous, on a white ground. The thighs are, herring-boned with brown; and the tarsi and vent, narrowly streaked lengthwise with the same colour. The under tail coverts transversely barred with mixed rufous and brown: and the ground colour of the thighs and tarsi, for the most part, rufous. The lining of the wings is an irregular mixture of the hues of the upper and lower surfaces: or saturate brown and white, stained with rufous. There are six narrow, irregular cross bars on the tail, with

one broad terminal one, of a blackish hue; but the tip itself is pale. The wings and tail, on their inner surface, are whitish, irregularly crossed with freckles of brown, disposed barwise.

The bird measured 27 inches by 60, and weighed 5 lbs.

VI.—*Synoptical Description of Sundry New Animals, enumerated in the Catalogue of Nipálese Mammals.* By B. H. HODGSON, Esq.

SCIUROPTERUS, Cuvier.

Species, *Alboniger*. Black and white.

Flying Squirrel, mihi.

Habitat, central and Northern regions of Nipál.

Sc. above black, faintly shaded with hoary or rufous; below, white, with a slight tinge of yellow; tail, concolorous with the body above, distinctly distichous, flattened, and rather shorter than the animal. Nude skin of lips, ears, and feet fleshy white. Snout to rump, 11 inches; tail, $8\frac{1}{4}$, without the terminal hair—9, with it; weight, 9 oz.

Observations. The sexes are alike: the young are pure black above, pure white below. The species has but six teats, four ventral and two inguinal. The intestines are 85 inches long, or eight times the length of the animal. They have a wide cæcum of nine inches in length, placed at 18 inches only from the anal extremity.

Species, *Magnificus*. Splendid.

Flying Squirrel, mihi.

Habitat, as above.

Sc. Above, intense chesnut, (the fruit;) below and the shoulders, golden red; tail, paler than the body above, and tipped black: a black zone round the eyes, and another embracing the mustachios; chin, pale, with a black triangular spot. Nude parts of skin, fleshy white. Tail, cylindrico-depressed, and considerably longer than the animal.

Parachute, large, enveloping six inches of the tail. Length of the animal, 16 inches, of the tail, 22; weight $3\frac{1}{4}$ lbs.

Observations. Sexes, essentially similar in colour. In old animals the chesnut colour tipt hoary, and, in the young, black tipt. In all, the tail, beyond the limits of the parachute, is paler than the superior surface of the body: and the black point is always present. So are the facial marks, though they be less conspicuous in young specimens. The intestinal canal is fourteen feet two inches long, or $10\frac{1}{2}$ times as long as the body; 8.8 to the cæcum; 5.6 below it. The

cæcum is 20 inches long, very capacious, and sacculated. This species breeds in the rains, and seems to produce but one young at a time. In September, the offspring are tolerably independent of their mother, but their flying membrane is much less developed than in maturity.

Genus, *SCIURUS*, Auctorum.

Species, *Lokriah*, mihi.

Habitat, as before.

Above, saturate brown, tipped with intense orange; below, and the thighs, deep orange. Tail, concolorous with the body above, distichous, flattened, and broad, with a double margin of black and hoary. Length from snout to rump, eight inches. Of the tail, $6\frac{1}{2}$ inches, without the terminal hair, equal to animal with it; weight 8 oz.

Species, *Lokroides*, mihi.

Very similar to the last, but has the inferior parts rufous hoary; the thighs, concolorous with the body above, and the tail narrower and void of marginal bands.

Observations. The sexes alike in both the above species. Teats, six in both*. Intestines, 66 inches, or but eight times the length of the body, and of uniform calibre throughout. At 15 inches from the anal extremity, a cæcum of four to five inches long, and double the calibre of the intestinal canal.

Genus, *FELIS*, Auctorum.

Species, *Viverriceps*, mihi. Sharp-faced Cat, mihi.

Habitat, open lowlands of lower region.

F. V. Wild cat, with subviverrine face, small ears, and short, slender, and tapered tail, reaching one inch below the os calcis. Above, and the neck, deep cat gray, or fulvous gray brown. Below, the head, tail, belly, and insides of the limbs, hoary. From the eyes to the root of the tail, four subcontinuous black lines: two more parallel to, and without, them, from the eyes to the shoulders; two perfect bands round the jaws, from the eyes: and three round the front of the neck and breast. Ears, black outside, with a large gray central spot, and rufous hoary on the inside. Body and limbs, wholly covered with roundish full black spots, having a sublinear disposition from the head towards the tail; the feet only, from the os calcis and top of the carpi, being immaculate. The tail exhibits above and below the ground colours of the body. On the upper surface, six or seven transverse bands, the two or three next the body, composed of dots, arranged linearly, and the terminal one being large, forming a blackish tip to the tail on that surface. Length, from snout to rump, 30 inches;

* In the Regne Animal, eight teats are assigned to the squirrels.

of the tail, $10\frac{1}{2}$ inches, or $11\frac{1}{4}$ with the hair : mean height, 15 : weight 17 lbs.

Observations. This species is affined to the Viverræ by the form of its face, and to the Lynxes, by the shortness of its tail, which extends but little below the os calcis. But it has no further resemblance to either : its ears being noticeably short and untufted ; its body, full, and its limbs, strong and of medial length. The females are nearly as large as the males, to which they bear a close external likeness. In the catalogue, this animal is called a variety of the Serval ; but the inspection of several specimens has satisfied me of its specific novelty. It is distinctly described in the catalogue, though summarily. The intestinal canal is more than three times the length of the body, and the cæcum is an inch long, with the diameter of the large gut, which is sensibly more capacious than the small.

Genus, FELIS. Subgenus, *Lynchus*.

Species, *L. Erythrotus*. Red-eared Lynx, mihi.

Habitat, all the three regions of Nipál, and abundant in all.

Lynx. Above, pale earthen brown, with a lively tinge of rusty red : below, clear, but pale ferruginous ; the body, immaculate ; the cubits on both aspects, and the femora externally, crossed with blackish zigzag lines ; tail slender, attenuated, and reaching one inch below the os calcis ; concolorous with the body towards the base, but towards the tip, paler and canescent, encircled with four or five blackish rings, and tipped with black ; lips, jaw, and a zone round the eye, posteally, pure white. Ears, externally intense, rusty red, with black tip and small pencil of the same hue ; their lining, rufescent white ; feet, from the os calcis and top of the wrist, downwards, pale rusty, immaculate, and blackened posteally.

Snout to rump, 22 inches ; mean height, 16 inches ; length of tail, 10, without the hair, 11 with it ; weight, 14 lbs.

Remarks. The female in this species is considerably less than the male, but neither sex nor nonage affects the marking of the animals. An imperfect state of the fur does so : for when the red-eared Lynx is moulting (so to speak), the sides of the body exhibit some vague, wavy, stripes, having a subvertical direction.

The tufts of the ears are always present, and the molar teeth have tubercles on the inner side, notwithstanding the general assertion of authors that the Lynxes want them. His lengthened limbs, large pencilled ears, and shortish tail proclaim this animal a Lynx. His resemblance indeed to the *Chaus* of RUPPEL is so very striking, that in the catalogue I identified him with that species. From the examination of numberless specimens, I am now satisfied, however, that our ani-

mal is specifically distinct from the *Chaus*, as well as from the Lybian *Caracal*, to which in some points of colouring, he bears a nearer likeness than to *Chaus*. This species is very ubiquitarian, being equally common in all the three regions of *Nepál*. In the central and northern regions, he represents the wild cat, which is not a denizen of these mountains; nor (I think) of the plains of India.

The red-eared *Lynx* breeds twice a year, producing three or four kittens at a birth.

The intestinal canal of the species barely exceeds twice the length of the body, and is of nearly equal calibre throughout. The *cæcum* is but half an inch long, with a breadth somewhat less than that of the large gut. Preys on pheasants, partridges, hares, and rats: breeds in the woods, but wanders freely through the standing crops. One of them, a female, took up its abode, and bred, under the residency mansion, in the past year.

Genus *MUS*, Auctorum.

Subgenus, *RATTUS*, (*MUS*.)

Species, *R. Niviventer*. White-bellied Rat, *mihí*.

Above, saturate black brown: below, pure white; tail, considerably longer than the body, and paled on the inferior surface. Size and aspect of *Mus Rattus*.

Observations. For some time I took this animal to be a variety merely of the common types, but I have now ascertained that it is a distinct species*. It is invariably pure white below, and even the tail is paled on the abdominal aspect.

The tail, too, is considerably longer than in *Rattus*.

Species, *RATTUS. Nemorivagus*, *mihí*. Throughout, dusky brown: the centre of the belly only being paler and hoary blue; the bristles of the back, unusually long and numerous, but not erect or spiny; tail shorter than the body, size large; snout to rump, 12 inches. Length of the tail, $9\frac{1}{2}$; ears, tail, and members strictly assimilating with the ordinary type.

Remarks. The species avoids houses, dwelling in burrows in the fields, and more especially in the small woods. In the catalogue, it is called *Setifer*, to which species it bears much resemblance. The females have twelve teats.

Genus, *MANIS* auctorum.

Species, *Auritus*, *mihí*. Eared *Manis*.

Habitat, lower and central regions.

* In the central region of *Nepál*, there are four species of Rat, *Decumaus*, *Rattus*, *Niviventer*, and *Nemorivagus*. Each distinguished by an appropriate local name, and by some peculiarity of manners.

Manis, with rounded, naked ears, vertically developed; thick tail, more than one third shorter than the body; and scales forming 23 longitudinal series on the body and neck only. Snout to vent, 22 inches. Vent to tip of tail, 13. Weight, 12 to 14 lbs.

Remarks. In the English Regne Animal the genus *Manis* is said to be devoid of external ears. Presuming the correctness of this statement, I have indicated a remarkable peculiarity of the present species by the specific name *Auritus*. The external ear, though small, is perfectly distinct; the helix having a breadth or free exertion from the head, of more than half an inch, and a longitudinal course of one and an eighth inch, in a direction vertically transverse. In the catalogue, this animal is mentioned by the name of the short-tailed or common Indian species, (*M. Pentadactyla* of Linn.) with which I then supposed it to be identical. It differs however very materially, not only by the presence of ears, but by the much greater number of its scales. In our animal, the longitudinal series consists of 23 for the neck and body alone; there being also 10 for the head, and 19 for the tail. The *Manis Javanica* of DESMAREST is said to have a series of 17 for the body only. I presume our's yet exceeds this number. The general appearance of our animal is sufficiently assimilated to *Crasicaudata*; the body being rather full, though elongated, and the tail shorter than the body, and very thick at the base.

This latter member is flattened below; broadly convexed above; and its scales are shorter and wider than those of the body. The feet are pentadactylous; the colour of the scales, earthy brown, and of the nude skin, fleshly white. As I have been so fortunate as recently to witness the gestation and parturition of this species, and have been also enabled to note the animal's manners, with its anatomical structure, I purpose, ere long to give the results of these observations; and shall only add, on the present occasion, that if the incaution of authors only has led to the assertion, that the genus is earless, and the epithet *Auritus* affixed to our species thus cease to be characteristic, I would then suggest the trivial name *Plurisquamis*, or the many-scaled.

Genus VIVERRA.

Subgenus, MANGUSTA, (*Herpestes*.)

Species *Auropunctata*, mihi.

Habitat, the Central Region.

Mongoose. Of an uniform saturate olive brown, freckled with golden yellow, an aspect resulting from the five-fold annulation of each hair, with black and aureous; cheeks, more or less rusty; fur of the body, short, soft, and adpressed; $\frac{1}{2}$ an inch below os calcis furred; size small;

tail, shorter than the body, snout to rump, 11 inches ; tail, 9 or $10\frac{3}{4}$ with the hair.

Remarks. In this species, as in the following, the tail is pointed, much attenuated from a thick base, and clad in long lax hair. The naked skin of the lips and soles is fleshy brown : the iris, brownish yellow ; pupil, variable, but usually oblong and subtransverse ; digits, membraned crescentwise to the third phalanges. No anal pouch, but the folds of the skin on the caudal margin of the anus are subdivided and furnished with some scattered glandulous points below the surface, probably subservient merely to the lubrication of the parts. The animal emitting no peculiar odour.

The intestinal canal is 36 inches long, or more than three times the length of the body, and of equal diameter throughout. The cæcum is one inch long, and wide as the gut. The stomach has thickish coats, and is equally broad almost at either end. The molar teeth are bristled with points almost as in the Insectivora. In the catalogue, this animal is identified with the *M. Javanica* of HORSFIELD. But in the judgment of very competent persons, it is a distinct species. It differs materially from the common Mongoose of the plains, not only by its smaller size, softer shorter hair, and darker colour, but by a less vermiform habit of the body and shorter toes, the soles of which, in the hinder extremities, are less extended towards the os calcis.

Species *Nyula, mihi.*

The *Nyul* of the plains. Habitat, the open Taraï.

Mongoose. Varied, with mixed rich red brown and hoary yellow, the ears, face, and limbs, redder and less maculate ; the neck and body below, pure pale yellow ; hair of the body and tail, long and harsh, with 10 to 12 rings of alternate brown and yellow ; toes, long, and in the hind extremities, nude to the os calcis ; tail, concolorous with the body above, pointed and equal to the body in length. Snout to rump, 15 inches ; tail, the same, or 18 with the terminal hair.

Remarks. This is the common Mongoose of the Nipalese lowlands, and of North Behar, and which is identified with *Cafra* vel *Grisea* in the catalogue, perhaps justly so : I leave it to others to judge. Both of the above species affect the cultivated fields when the crops are standing, and the grass after the crops are down. They live in burrows of their own making ; and the structure of their extremities is fossorial, but not typically so ; the nails being suited also to climbing trees, at which the animals are sufficiently expert.

The males are larger than the females ; and the young darker hued than their parents. The females breed in spring : have four ventral teats, and usually produce three or four young at a birth. The food

of both species consists of snakes, rats, mice, eggs, small birds, and grilli.

Mr. GRAY in some recent valuable remarks on the Viverridæ, observes, that the Mongoose have "long, slender, and free toes, and anal pouches of greater or less depth." I have again and again examined fresh specimens of Nyúla and of Auropunctata, with a view to these assertions, but the result of my observations is that they are almost wholly erroneous. Neither in the highland nor lowland animal is there any semblance of an anal pouch; and the toes of both are connected by a membrane as far forwards as the hinder edge of the third phalanx. In Nyúla, indeed the toes are elongated, and the hind feet nearly nude to the heel. In Auropunctata, however, the toes have but a medial length, and the fur reaches fully half an inch below the point of the heel.

The fact is, that the structure of the Mongoose, though digitigrade upon the whole, is by no means typically so: and, in the slow stealthy motion to which they are much accustomed whilst questing for their prey, they use the plantigrade action. Their nails are fossorial in the main; and, like most diggers, these animals incline somewhat to the plantigrade structure and movement. In fact, they lead off from the typical digitigrades towards the plantigrades, through the Paradoxuri, the Gluttons and the Rattels; still, however, retaining the shortish toes and lengthened compact metatarsi of the digitigrades.

Tribe, PLANTIGRADES.

Genus, GULO. English Regne Animal.

Species new. *Gulo Nipalensis*, mihi.

Habitat, Central region of Nipal.

G. Above, earthy brown: below, with the edge of the upper lip, the insides of the limbs, and terminal half of tail, yellow; a white mesial stroke from the nape to the hips, and a white band across the forehead, spreading on the cheeks and confluent with the pale colour of the animal's lower surface: head and body vermiformed; digits and nails of the anterior extremities stronger; half way from the os calcis to the fingers, hairy; fur of two sorts, and abundant, but not lengthened or harsh, nor annulated: tail, cylindrico-tapered, pointed, half the length of the animal; snout to rump, 16 inches; tail, $7\frac{1}{2}$, or 9 with the terminal hair.

Remarks. In the catalogue, this animal is identified with the *Gulo Orientalis* of Java (apud HORSFIELD), which is at all events, the insular analogue of our's. The cheek teeth are $\frac{5}{8} \frac{5}{8}$ and the animal consequently belongs to genus *Gulo*, as defined in the English Regne Animal.

The form of this species is decidedly Musteline from the snout to the tail; and not merely the head, with its several external organs, but the skull also bears a close resemblance to those of *Martes* and *Putorius*. The anterior limbs, however, are decidedly fossorial, and the hinder suited for walking in a subplantigrade manner: *both* wholly unfitted for raptatory or scansorial purposes.

Genus *GULO*. Species new.

G. Urvá, mihi. Habitat, Central and Northern Regions.

Urvá of the Nipálese.

G. Urvá. Above and the sides jackal colour, or fulvous iron gray; abdominal aspect of the neck, chest, and belly, with the entire limbs, dusky brown, a lateral band on either side the neck, from the gape to the shoulders, white; size and aspect of the preceding; fur of two sorts, and very abundant; hair very long, and laxly set on; quadrannulated with black and fulvous; anterior and posterior extremities of equal strength, and the nails simply ambulatory, being suited neither to raption, scansion, nor digging; for the rest, the general form of the feet as in the preceding,

P. S. The whole of the above animals were discovered by me several years back (1823-1829), and might have been described much sooner, had I not deemed it improper to hazard the multiplication of imaginary species by characterising from one or two specimens. There is not one of these species of which I have not procured several specimens at all seasons, and either alive or just killed. The indications of the catalogue are such as to entitle me to date from its publication (originally in 1829). But, in truth, my object has been, and is, much less to share in the scramble of nomenclators, than to ascertain the habits and structure of species.

Nothing is so vague at present as the true limits of species, and as my *first* aim was rather to find resemblances than differences, so perhaps it might wisely have been my *last*.

If, however, any person who chances to lay hold upon a single shrivelled skin, may forthwith announce a new animal, the real student of nature must be content to leave what is called discovery to the mere nomenclator; and the science must continue to groan under an increasing weight of fictitious species.

B. H. H.

VII.—*Note on the occasional existence of fresh water on the surface of the ocean.* By Mr. C. BROWNLOW.

It is stated in a recent paper by ARAGO, on the subject of Artesian Wells, upon the authority of one of our most accurate observers—BUCHANAN—that, when on his way to India, he found fresh water more than one hundred miles from land, to the eastward of the Bay of Bengal. ARAGO has adduced this fact to prove, that springs rise to the surface of the globe from unknown depths. He is doubtless correct in this assertion, as long as he confines his observations to land phenomena—many causes, however, led me to doubt that *fresh* water could *rise* to the surface at sea, among which may be enumerated the effects of tides, the disturbance and friction of one fluid passing up through the other, and the strong affinity which aids their combination while thus in motion.

The fact that fresh water deposited in the shape of rain, remains unmixed with the salt water beneath, for many hours, during calm weather; that it is found at sea, around the mouths of large rivers, during serene days, at an almost incredible distance, led me to seek for an explanation of BUCHANAN'S fact, in some less embarrassing theory than the one which ARAGO has adopted. I accordingly applied to Mr. SINCLAIR, one of the most experienced and intelligent of the members of the Pilot service, who acquainted me with the following fact.

In the month of October, 1803, in connection with Branch Pilot BASON, he took charge of the *Gungava*, an Arab ship, from Muscat, laden with horses. The passage of the vessel had been long and tedious, and they were deliberating on throwing their horses overboard, when one of the men, who had been bathing on a hatch, came and reported that the water along side was *fresh*; a bucket was thrown over, which went something below the surface, and the water brought up was salt!—on further examination, it was found that the water *on the surface* was perfectly fresh. The vessel was supplied from this source, and the cargo saved. Another member of the same body informs me, that during the Burmese war, he obtained fresh water thus when taking troops to Rangoon*.

It appears more reasonable to account for this fact, by referring to the increased impulse of the waters discharged from the Ganges during the rains, to the quantity of fresh water actually deposited on the surface of the sea, at this season of the year, and to the laws of the specific gravity which determine the relative positions of fluid bodies, than to adopt a theory which at once sets these aside, and does violence to an established principle in physics: for these reasons I think ARAGO'S inference open to objection.

* These instances occurred over that remarkable part of the bay, the "*swatch of no ground*," the depth of which renders ARAGO'S theory still more untenable!

VIII.—Note on the *Cervus Duvaucelii* of Cuvier, or *C. Elaphoides* and *Bahraiya* of Hodgson.

In the number of the Journal for last November, p. 648, Pl. VIII. Mr. HODGSON has given the specific characters, and a figure of the head and horns, of a deer which he describes as a new species under the name of *Cervus Elaphoides*. The author of this notice came to know this species in February 1834, from a fine specimen shot by Mr. MONEY in a jhîl near Muzaffernagar, in the Kadir of the Ganges. Finding no mention* made of it in HAMILTON SMITH'S very complete Synopsis of the tribe in GRIFFITH'S Translation of the Animal Kingdom, he was, like Mr. HODGSON, led to consider it as an undescribed species, to which he attached, in his collection, the specific name of *C. Enclodocerus*, and "*Bara Sinha*," of the natives. But he subsequently found that it was known to CUVIER as a distinct species. In the fourth volume of the *Ossemens Fossiles*, third edition, p. 505, the horns of the animal are described under the name of *C. Duvaucelii*, in honour of his step-son, who sent them to CUVIER from India; and in Plate XXXIX of the same volume, he gives outlines of three varieties of horns (figs. 6, 7, and 8,) which put it beyond all doubt that the *C. Duvaucelii* of the *Oss. Fossi.*, and the *Cervus Elaphoides* of HODGSON, are the same species. CUVIER'S words are these:

"Cet infatigable naturaliste M. DUVAUCEL, me met encore à même de faire connoître à mes lecteurs deux espèces de cerf des Indes entièrement nouvelles pour les naturalistes.

"La première, &c. (he then goes on to describe the *C. Wallichii*.) Nous n'avons que les bois de l'autre espèce, mais ils suffisent parfaitement pour la caractériser.

"A la première vue on les prendroit pour ceux d'un vieux cerf commun, et bien des voyageurs ont dû s'y tromper, mais c'est toute une autre courbure, et une autre distribution d'andouillers.

"Le Merrain se dirige d'abord un peu un arrière et de côté, et de sa partie supérieure se recourbe en avant, en sorte que sa concavité est en avant comme au cerf de Virginie; mais cette courbure n'y est pas si forte.

"Il ne donne qu'un seul andouiller de sa base, dirigé en avant.

"Les autres naissent de sa partie supérieure et postérieure, et se dirigent en haut, et un peu en arrière et en dedans.

"Ils sont au nombre de deux, ou de trois, et l'inférieur qui est ordinairement le plus grand, se bifurque ou se trifurque suivant l'âge; en sorte qu'au total on peut compter dans les bois que nous avons sous les yeux, et que nous représentont pl. xxxix. figs. 6, 7, et 8, de cinq à sept cors à chaque perche; quelquefois il y'a un petit tubercule dans l'aisselle de l'andouille de la base."

* Except in the note p. 116, vol. IV. where HAMILTON SMITH quotes CUVIER'S name, with a conjecture that it applied to some species of the group *Rusa*.

Inscription at Bamian. (See p. 188)



Copper figure dug up near Bamiān



Fig. 1
□ ◡ ◡ ◡ ◡

Buddhist image from Tugung (p. 157)
1/2 Size

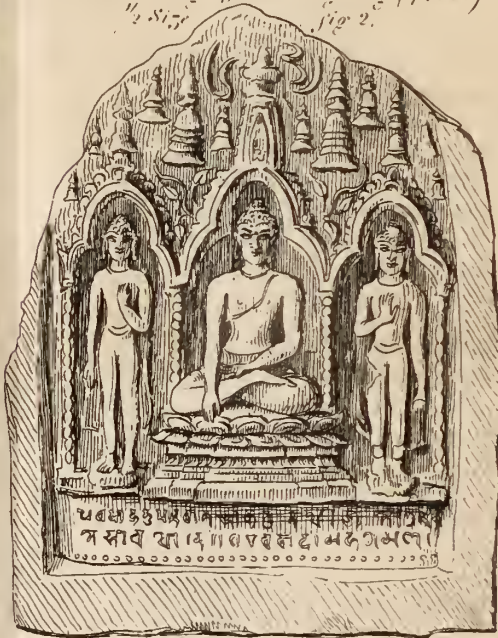
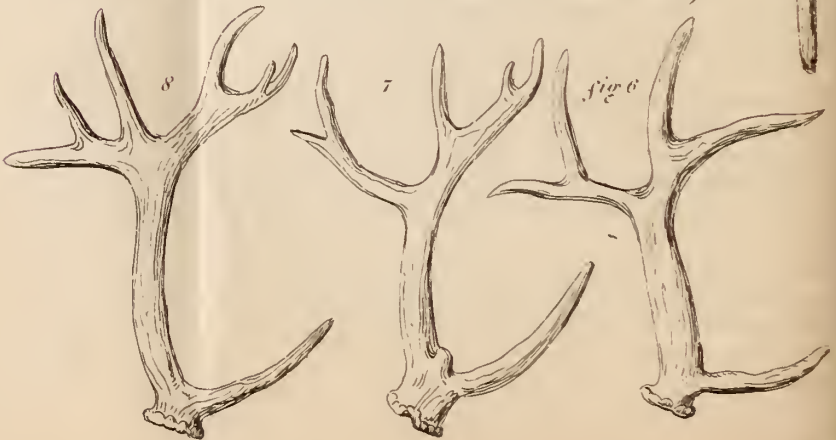


Fig. 2.



Bhctia Standard.

Cervus Durandii Gir. (Oss. foss. II. P. XXXIX)



“ Il est fort a desirer que l'on obtienne promptement une description du pelage de ce beau cerf; mais en attendant nous croyons devoir lui donner le nom du naturaliste qui l'a fait connoitre, et nous l'appellerons *Cervus Duvaucelii*.”

Copies of CUVIER's figures are annexed, (see Pl. VI. figs. 6, 7, 8) which differ only from Mr. HODGSON's to the extent within which varieties dependent on age and individuals range.

The designation of *Cervus Elaphoides*, must therefore give place to that of *C. Duvaucelii*.

The chief anatomical peculiarities of the head, as compared with the Jarao of the Himalayahs, taken as the type of the Rusas, are these. The head is narrower for its length, and more elegant in its proportions, than in the Jarao. The pediciles of the horns are shorter, and more approximated on the brow. The muzzle is longer and more slender. The intermaxillaries are broad, as in the Rusas, and their ascending apophysis joins on to the nasals by a wide base. The nasals are slender, and run up into the frontal in a line with the anterior margin of the orbits: in the Jarao, the point of union is considerably lower, their lower extremity projects a little way beyond the intermaxillaries, and a re-entering angle is left between them at their tips. The nasolachrymary figure is a wide trapezium, whereas in the Himalayah Jarao, it is a long triangular slit. The depression for the suborbital sinus occupies less space than in the Jarao, but it is deep and well defined. The lachrymal bone, at the upper angle of the depression in the *C. Duvaucelii*, is perforated by a very large oval hole; whereas in the Jarao it is imperforate. The chaffron has a slight rise on the nasals, sinks considerably in a transverse hollow between the orbits, and then starts with great prominence in the ridge which runs along the suture of the frontals, so that the plane of this ridge cuts that of the parietals nearly at a right angle. In the Jarao, the sink between the orbits is shallower, the ridge less salient on the frontals, and the angle more obtuse.

With regard to the indigenous names of the *C. Duvaucelii*, Mr. HODGSON gives the Nipálese name of *Bakraiya*, and says it is known in the western tarái as the *Mahá*. To *C. Elaphus* of the Nipálese sál forest, he gives the name of *Bára sinha*.

There is great confusion in the Indian designations of the deer tribe. *Bára Sinha* is a notable example. HAMILTON SMITH applies it (his *Baren-sing'ha*) to the *C. Hippelaphus*, one of the Rusas; Mr. HODGSON to one of the *Elaphine* group; and in the Tarais to the west of the Ganges, so far as our experience goes, it is given to the *Cervus Duvaucelii* or *Elaphoides*, of HODGSON. That it is inapplicable to the *C. Elaphus*, it is perhaps sufficient to mention, that the name of *Bára Sinha* is very common in the Tarái westward of the Ganges, whereas the *Cervus Elaphus* is quite unknown in this tract, so far as we happen to know. Sportsmen westward from the Ganges, call the *C. Duvaucelii*, the *Bara Sinha*, from the snags and antlers being frequently twelve in number, in the adult animal, and this seems a very good reason for the name, *Mahá*, which Mr. HODGSON

applies to the species, we have always understood to belong to the *Rusa* of the Himálayah; this name being given in Sub-Himálayah tracts; and *Jarao* (or *Jerow*) in the interior of the Hills, to one or more species, but these strictly confined to the *Rusa* group. Mr. HODGSON'S authority, as the first among Indian Zoologists, will give great weight to such names as he attaches to the deer tribe; and it is most desirable, that those most generally in use should be selected. If those who have the opportunity, in different districts, were to communicate the names by which they know the different species of the deer tribe, much of the vagueness which at present attaches to the native designations might be got over.

The following names are in common use in the plains and hills westward of the Ganges, their synonyms are also given.

Merg, applied, as a general designation for all the deer tribe; *Cervidæ* and *Capridæ*.

Jhank, applied to all the *Cervidæ*, but more especially to the large species.

C. Duvaucelii, CUV., and *Elaphoides* of HODG., called *Bara Singha*, *Bahraiya* of the Nipálese, HODG.

C. Hippelaphus? and *Aristolelis*, or *Rusas*, called *Mahá* in the Sub-Himálayan tracts, and *Jarao* (*Jerow*) in the interior of the mountains. Syns. *Saumer* of Bengal and *Jarai* of Nepál.

C. Ratwa, HODG., called "*Kakar*"—*Ratwa* of Nepál.

A. Ghoral, HARDW., *Ghoral* everywhere.

A. Thar, HODG., called "*Sarao*" (*Surrowa*) in the hills between the Ganges and Tonse; between the Tonse and Sutlej called "*Eimoo*," the *Thár* of Nepál.

A. Tetracornis, called "*Chouka*" or "*Chousinga*." *Chikara* on the authority of HARDW.; but this name applied to the

A. Acuticornis? or *Subulata*? an elegant small sized antelope, with horn on the females, numerous about Delhi, and there called "*Chikara*."

Capra Jharal, HODG. (*Quadrirammiss*? see p. 254) called *Tehr* and *Thár*; *Jharál* of Nepál.

C. Ibez? called *Sakeen* in Kanáwar. This species, which is strictly an *Ibez*, is got along with the *Bhuroor*. It does not appear to be known to Mr. HODGSON; Major KENNEDY had two stuffed specimens at *Subatu*.

Ovis Nahoor, HODG., called *Bhuroor* near the source of the Ganges; *Nahoor* of Nepál.

The *Antilope Cervicapra*, (*Hiran*;) *Cervus axis*, (*Cheetul*;) *C. Porcinus*, (*Parah*;) *Antilope Picta* or *Damalis Resia*, (*Nilgao*,) are so generally known by these names, that it is hardly necessary to mention them.

Note.—The animal to which the above principally refers was known to Mr. HODGSON from 1820, when there was a live one in the Durbar Menagerie at *Katmandhu*, though not accurately observed by him, he had, and used, the occasion of another specimen being there in 1825, to note the characters of the beast. Monsieur DUVAUCEL was his friend and correspondent, and was assisted by him to the utmost; two of his collectors lived in his house at *Katmandhu* for a year (1827-8,) and were furnished out of his own stores with sundry specimens.

M. DUVAUCEL may therefore have procured the beast from him, or through him; it is certain that Mr. H. knew this stag before the latter came to India.—Ed.

IX.—Horary Observations of the Barometer, Thermometer, and wet-bulb Thermometer, made at Calcutta on the 21st and 22nd of March, 1836. By Mr. H. BARROW, H. C. Mathematical Instrument-maker.

1836. Date.	Hour.	Barometer.	Attached Thermometer.	Wet Bulb Thermometer.	External Thermometer.	Barometer Reduced to 32°.	Depression of Wet Bulb Thermometer.	Remarks.
21 March	6 A.M.	29,975	74,0	68,8	69,5	29,879	5,2	
	7	,998	74,0	68,0	70,0	,902	6,0	
	8	30,016	75,0	68,0	74,0	,917	7,0	
	9	,019	76,0	68,0	76,2	,917	8,0	
	10	,031	77,0	69,2	79,5	,926	7,8	
	11	,040	78,5	69,0	81,0	,931	9,5	
	Noon.	,026	80,0	69,2	81,8	,912	10,8	
	1	29,998	81,0	70,0	83,0	,881	11,0	
	2	,975	81,5	71,0	84,5	,856	10,5	
	3	,951	81,8	70,6	83,5	,831	11,2	
	4	,926	81,5	70,0	81,0	,807	11,5	
	5	,926	80,5	69,3	80,0	,811	11,2	
	6	,953	79,9	69,2	77,0	,839	10,7	
	7	,938	77,1	69,7	71,0	,833	7,4	
	8	,957	76,0	69,0	72,0	,855	7,0	
	9	30,001	76,0	69,9	72,0	,899	6,1	
	10	29,970	76,0	68,0	71,6	,868	8,0	
	11	,951	74,9	67,5	71,0	,852	7,4	
	Midnt.	,964	74,8	70,0	71,3	,865	4,8	
22 Do...	1	,944	75,1	70,1	70,0	,845	5,0	
	2	,942	75,0	70,5	68,0	,843	4,5	
	3	,938	75,0	70,5	68,0	,839	4,5	
	4	,932	74,5	70,0	68,0	,834	4,5	
	5	,961	75,0	70,6	67,0	,862	4,4	
	6	,982	72,7	68,0	67,5	,889	4,7	
	7	30,000	71,4	68,0	70,5	,912	3,4	
	8	,015	73,0	70,0	74,0	,912	3,0	
	9	,030	74,6	69,5	74,0	,932	5,1	
	10	,040	74,5	69,3	74,5	,942	5,2	
	11	,028	74,0	68,3	75,0	,932	5,7	
	Noon.	,000	74,5	69,0	78,0	,902	5,5	
	1	29,973	75,0	69,5	77,5	,874	5,5	
	2	,947	75,5	69,0	83,0	,847	6,5	
	3	,916	76,5	70,0	79,5	,813	6,5	
	4	,904	77,2	69,5	80,0	,799	7,7	
	5	,911	78,0	69,5	80,0	,803	8,5	
	6	,916	77,5	70,0	77,2	,810	7,5	

Rain with thunder and lightning, which continued part of the next day.

The above observations were made with a Barometer in every respect the same as the one used on the 21st and 22nd of December last, except that the bulb of the attached Thermometer is inserted in the Barometer cistern to better ascertain the Temperature of the mercury. The reduction of the Barometer to 32° is made by the formula $t - 32 \times .003 \frac{B.}{50}$ and a constant .030 added for capillarity.

H. B.

Note.—On referring to my manuscript meteorological table for the month of March, I find that an error of .05 has been made in the printed entry of the two barometers at 10 A. M. on the 21st, which should stand 29,899 and 29,947. After correcting these, it will be found that to reduce Mr. BARROW's observations to terms of the barometer I have hitherto registered .015 must be added to the corrected column at 32°: and to compare them to the new standard by NEWMAN .029 must be deducted.

These discrepancies are nothing more than index errors; but as it is a matter of some importance to know which gives the correct altitude, and why an instrument commissioned with such precautions from the best maker at home should stand three or four hundredths of an inch *lower* than tubes made, filled, boiled, and measured in Calcutta; I have with Mr. BARROW's aid remeasured the scales of the several instruments respectively from 0 to the 30 inch mark, by a standard brass scale of TROUGHTON's at the temperature of 95°.

Mr. BARROW's scale was laid off by himself exactly.....	30,000 inches.
My compensation barometer to a scratch on the glass originally marked by myself with the same care, was found on remeasurement to be quite correct.....	} 30,000
NEWMAN's Strd. 1st trial $29,658 + 1,176 - 0,814 = 30,020$	
2nd do. $28,746 + 1,176 + 0,100 = 30,022$	
3rd do. $28,848 + 1,176 \dots = 30,018$	

The principal difficulty in measuring the column of NEWMAN's instrument was to find the distance from the lower end of the ivory cone (or the level of the mercury in the cistern) to the upper part of the cistern: this I made by several trials 1,173 to 1,176; Mr. BARROW made it 1,182 and 1,183; Mr. PEARSON 1,172: I have taken it at 1,176 as the mean, and feel confident the error of the whole measurement does not amount to 0,005 inch. The readings therefore of this instrument in every instance will be .020 too low.

I am reluctant to suppose Mr. NEWMAN should have sent me a barometer at such a vast cost so carelessly verified; but such seems to be the case from the above measurement, which is confirmed by the register; for allowing .009 for the expansion of the brass scale, and adding it to the index error above, we find almost the exact amount by which the new instrument stands lower than my former standard, which latter has been compared by three opportunities with the Royal Society's barometer and found to agree very closely. Mr. NEWMAN neglected to make this comparison, although I particularly requested it.

J. P.

X.—*Proceedings of the Asiatic Society.**Wednesday Evening, the 4th May, 1836.*

The Hon'ble Sir EDWARD RYAN, President, in the Chair.

In reference to the resolution of the last meeting, the President stated, that he had addressed the following letter to the Governor General, whose acceptance of the office of Patron he had now the pleasure to announce.

Asiatic Society's Apartments, May 2nd, 1836.

MY LORD,

I have the honor to inform you, that at a Meeting of the Asiatic Society, held on the 6th April last, it was resolved "that the Right Honorable Lord AUCKLAND should be respectfully solicited to accept the office of Patron;" and it was further determined, "that the President of the Society should be requested to communicate their wish to his Lordship, and to ascertain his pleasure on the subject."

As President of the Society, I have the honor to communicate their wishes, and respectfully to request you will inform me whether it is your Lordship's pleasure to accept this Office.

I am, My Lord,

Your Lordship's most obedient servant,

E. RYAN.

The Right Hon'ble LORD AUCKLAND.

Government House, May 3rd, 1836.

SIR,

I have to acknowledge the receipt of your letter, and to assure you, that I gratefully accept the honorable title of Patron of the Asiatic Society, and shall be glad if, at any time, I should find it in my power to promote the objects of so excellent and so interesting an Institution.

I am,

Most faithfully, &c. your's,

Hon'ble Sir EDWARD RYAN,
&c. &c. &c.

AUCKLAND.

Lient.-Col. CAULFIELD, proposed at the last Meeting, was balloted for, and unanimously elected a Member.

Mr. R. W. G. FRITH was proposed as a member of the Society by Mr. JAMES PRINSEP, seconded by Mr. W. MARTIN.

Mr. WILLIAM BRUCE, proposed by Mr. PEARSON, seconded by Babu RAM COMUL SEN.

Mr. JAMES PRINSEP proposed Dr. LUMQUA, as an Honorary Member on the occasion of his return to China, seconded by Dr. CORBYN.

Read a letter from J. C. MORRIS, Esq., Secretary Madras Literary Society, acknowledging the receipt of the Index, and the Oriental Works lately transmitted.

The Secretary submitted to the Meeting the Proceedings of the Committee of Papers and Museum Committee, relative to the system of paid Curatorship, of which the experimental year sanctioned on the 6th May, 1835, had just expired.

[These proceedings are given at length below.]

The President reminded the Meeting of the alternatives suggested by the Report of the Committee: Members were to determine whether a paid Curator should still be maintained, under the certainty of the income of the ensuing year not being sufficient to cover even the ordinary expences, including the volume now in the press;—whether donations could be reckoned upon;—or whether the vested capital should be touched. Babu RAM COMUL SEN had proposed, that the latter should be devoted to the publication of the Researches, an application which might accord with the original intention of the donors. There was still an alternative—would any zealous Member undertake to look after the Museum gratuitously? All other offices in the Society were gratuitous; the Secretary, the Treasurer, although their labours were very heavy, even the Librarian, Dr. BURLINI, received no pay. If none offered to lend their aid, it

was evident they must have a paid Curator, if the Museum, which was so essential to the prosperity of the Society, were to be maintained at all.

Babu RAM COMUL SEN explained, that the invested sum of 17,000 Rupees was part of a legacy of 20,000 by the late Mr. BRUCE; this sum the Society had resolved to reserve, and to devote the interest of it to the printing of the Transactions; he therefore now wished to see the sum made up to the full amount once more; the interest 1000 per annum, would pay for the publication of a volume in four years, about the average hitherto issued.

The Secretary had, with the President, misunderstood his colleagues' meaning in Committee; he seconded his motion now most warmly; as long as the principal remained, it put the Society beyond the danger of dissolution: even if deserted by all its Members, there was a fund to keep up the rooms, the library, and the name of the Institution at least.

The publication of the present volume was the chief cause of the deficit in our budget: it would be an expensive volume from the number of plates; but the prosperity of the Society was even more concerned in the immediate and full publication of the fossil discoveries in Northern India, than in the maintenance of the Museum. It should be remembered, that M. BOUCHEZ, the Assistant and Working Curator, would be competent to set up all new specimens, and preserve the present collection; and could Dr. PEARSON be persuaded to lend his gratuitous supervision for the next year, after that the printing might be suspended, and he might again be put on pay. There was still another plan by which 1200 rupees might be saved, that of making Members pay for the Journal now issued gratis to them, or rather paid for out of the general fund.

Captain PEMBERTON and Dr. CORBYN considered the support of the Museum as a main cause of the Society's flourishing condition, and thought it would bring an accession of Members that would cover the expence; they therefore moved as an amendment:—

Resolved, that with reference to the probable advantages in a pecuniary way to the Society, from the continuance of the Museum, and in the absence of any other alternative, it is expedient that the Curator's establishment should be maintained another year on the present scale; and that the funds necessary for its support, in case of a deficiency of income, should be supplied from the money now invested in paper.

The amendment was carried by a majority of seven to five, the President not voting.

Library.

Read a letter from His Excellency General Saint SIMON, Pair de France, Governor of the French establishment in India, forwarding on behalf of Monsieur GARCIN DE TASSY, a copy of his edition of the text of *Kámarúpa* in Hindustani, of which he had before presented the translation; with other copies for distribution.

Journal Asiatique, Nos. 85, 86, 87, 88, were presented by the Asiatic Society of Paris.

Madras Journal of Literature and Science, Nos. 10 and 11, were presented by the Mad. Lit. Socy. and Auxiliary of the Royal Asiatic Society.

Meteorological Register for March 1836—*by the Surveyor General.*

The Indian Journal of Medical Science, No. 5—*by Dr. F. Corbyn.*

Read a letter from Dr. LUMQUA, presenting to the Society 352 volumes of valuable and useful Chinese books, of which the following is a catalogue. No.

1. 5 vols. *Tai hók chung yong*, 1st vol. works of the grandson, *Tsü-sü*, and of a disciple of Confucius.
Shiong-ton-hár-ton, 2nd and 3rd vols. Confucius' conversation with his disciples.
Shiong máng-hár-máng, 4th and 5th vols. ditto grandson's scholar's work Maug.
2. 5 vols. *Tai hók chung yong chli*, &c. Explanation of the above, 5 vols.
3. 3 vols. *Hao-king*, Confucius' works on moral duties.

4. 3 vols. *Shí king,* }
 5. 7 vols. *Shih king,* } Ancient records collected by Confucius.
 6. 6 vols. *Lai kí.* }
 7. *Chan-tsoo,* Confucius' works, moral tales.
 8. 2 vols. *Ká yü,* Ditto and his disciples' conversations on the creation.
 9. } 32 vols. *Honghi tsü pên,* Chinese Dictionary, by the Emperor of Honghí,
 10. } 130 years since.
 11. 8 vols. *Y-shap yat tsü,* Chronology of Kings' Ministers from the beginning to the Ming dynasty inclusive.
 12. 10 vols. *Qontung-san yü,* Statistics and Customs of the Canton provinces, a new work of some reputation.
 13. 32 vols. *Kad Tai Sing,* Laws of the Tai Sing dynasty.
 14. 14 vols. *Po-ong.* Cases, arguments, and royal decrees of the present Emperor.
 15. 4 vols. *Sai-un-lok,* Collection of difficult cases, with decisions.
 16. 5 vols. *Lóng-to kung-ong,* of the same nature.
 17. 4 vols. *Tsang sai un lok,* additions to No. 15.
 18. 38 vols. *Shan-sen-thang kán,* history of gods and saints.
 19. 1 vol. *Yau-fo-chí nám,* the compass of childhood, (on their diseases.)
 20. 5 vols. *Kam-kám-moë fo,* on Anatomy and Surgery, with prescriptions.
 21. 1 vol. *Yau fo fáit fáí,* (Director of childhood,) medical.
 22. 6 vols. *Yau fo tsap shin,* Collections of all the authors on diseases of childhood.
 23. 6 vols. *Y-fong pon cho,* a glossary of medicaments and ailments.
 24. 8 vols. *Wán ping föe chhan,* prescriptions for the cure of every case surgical and medical, of all ages.
 25. 4 vols. *Ná chan phên,* on the moral preservation of the life, and on sanctification.
 26. 6 vols. *Chhang tsü sing chá yet shü,* Chang tsü siug on horoscopy, or selection of fortunate days for building, marrying, &c.
 27. 6 vols. *Puk-yik,* on fortune telling.
 28. 9 vols. *Son-fá,* the accountant's guide.
 29. 2 vols. *To-tak-king,* book of the To (philosophers) religion.
 30. 8 vols. *Wud-fát-tay-shing,* book of synonyms.
 31. 6 vols. *Kong-sü-loi fú,* complete epitome of Natural History.
 32. 5 vols. *Shing yü hao,* mythology of heaven, earth, animals, mankind, (a kind of Lempriere,) for enriching language, with anecdotes.
 33. 2 vols. *Ying-ná,* abridged general history.
 34. 8 vols. *Yong chi tsuin chü,* Yong chi's collection of poetical extracts.
 35. 4 vols. *Chó-tsü,* specimens of elegant prose writing, by CHO-TSU.
 36. 15 vols. *Mán-tsuin,* collection of best essays.
 37. 4 vols. *Tsám long tsüing tsüi,* ditto of best poetry on the affections.
 38. 10 vols. *U-mán.* Best specimens of ancient composition.
 39. 5 vols. *T,hong-tsü.* Poetry of the Thong dynasty.
 40. 7 vols. *Y-wai-tsáp.* Poetry adapted to expression of feelings.
 41. 4 vols. *Chung-wá-fung tso kthong.* Customs of the Chinese empire.
 42. 5 vols. *Shü-pan.* Forms of petitions, letters, &c.
 43. 20 vols. *Lao-tsing san tsáp,* (a new work,) customs, ceremonies, letters, &c.
 44. 4 vols. *Kái-yán-y.* A poetical book of jests.
 45. 5 vols. *Sü-shí king mant shí.* Novelties of the four seasons.
 46. 2 vols. *Sit-yok.* Gems of good writing.
 47. 4 vols. *Tson shan.* Chinese Directory of general knowledge and court guide of salaries, &c.

The following Burmese and Talain manuscripts were presented by Capt. W. FOLEY :

No.		Language.	Character.	
67.	Vajira Buddhi Tíká,	Páli,	Barma...	312 p.
68.	Wessantara jataka, Danakhanda 3rd,	Páli-Talain,	Talain. ...	64 p.
69.	Ditto. —————, chha khattiya	ditto,	ditto....	40 p.
70.	Ditto. —————, ditto,	ditto,	ditto....	34 p.
71.	Janaka jataka,	ditto,	ditto....	52 p.
72.	Tika nipáta,	ditto,	ditto....	48 p.
73.	Patthána,	Páli,	Barma. ..	672 p.

PASCHAL AUCHER'S Armenian translation of MILTON'S *Paradise Lost*, was presented by Mr. JOHANNES AVDALL.

Mr. HODGSON, Resident in Nepál, forwarded to the Secretary several specimens of the drawings prepared for his proposed *Illustrations of the Geology of Nepál*.

Subscribers had held back from patronizing his work because no mention is made of price in Mr. H.'s *Prospectus*. Without consulting publishers at home, this cannot be done with any certainty; but as a guarantee that the charge shall be *below actual cost*, Mr. HODGSON states that he is willing to devote 3000 rupees towards the publication, of what has already cost him so much to accumulate. Any subscriber may withdraw hereafter should he disapprove of the terms; in fact, as he quaintly but truly observes, he does not seek to put himself under obligation to others, but rather *others* under obligation to *him*, by his devotion of time, labour, and money to this grand object*.

Resolved, that the Asiatic Society subscribe for two copies of Mr. HODGSON'S work, and that the *Prospectus* be circulated among its Members.

The Second volume (or rather the preface) of the *Sairul Mutakherin*, was presented by Maulavi ABDULMOJIB the editor and publisher.

Museum and Antiquities.

An elephant's tooth, carved all over with images of *Gautama*, an object of considerable curiosity and antiquity, procured in a cave near *Moulmein*, was presented by Captain W. FOLEY.

Dr. WALLICH presented in the name of Captain BOGLE, a wooden standard taken from the Bhotia army.

(See Plate VI. fig. 4.) It is a bit of plank mounted on a staff, painted red, with an image of Buddha, belligerent (?) on one side, and a Tibetan inscription on the back, (copy of which has been sent to Mr. CSOMA KÖRÖSI for translation. "The Demangari Rája always had it carried before him with great solemnity, and under the special keeping of a large guard of honor, who however in the affair of Subang-kotta ran away without it, and it fell into our hands.")

A Burmese musical instrument was presented by Ensign PHAYRE.

A small antique Persian image, dug up by a peasant near Bushire. By Capt. J. HEUNELL. This is depicted as fig. 3, of Plate VI.

Mr. AVDALL presented three Arsakian and one Sassanian coin.

Literary.

Read a note from JOHANNES AVDALL, Esq. on the reverse legend of some of the Indo-Scythic coins found by Mr. C. MASSON at Begrám in the Kohistán of Kábul.

A census of the Armenian population of the city of Calcutta was also presented by Mr. J. AVDALL.

Read a letter from Ensign NEWBOLD, forwarding for presentation to the Society an account of the 3rd of the four Menankábowe states on the Malay Peninsula.

Read a letter from Major JAMES LOW, dated Province Wellesley, 10th February, forwarding two manuscripts on Siamese literature, games, and music, and on the nature of the Siamese government, with specimens of Burmese and Malayan music.

* In any *other* country it would be termed *national* object, but *here* such a term might be misapplied. In France, the Government, alias the *nation*, publishes M. JACQUEMONT'S works,—purchases M. VENTURA'S collections,—devotes an annual grant to the Asiatic Society of Paris of 12,000 francs, as part and parcel of the national instruction system.—We need not pursue the parallel.

These manuscripts form a part of a mass of papers which the author had compiled many years ago, with the view to giving a connected account of Siam. The publications of Mr. CRAWFORD and others on that country, which satisfied public curiosity then, caused him to lay them aside; the present however contain facts either new or more circumstantially detailed than hitherto.

A brief description of Masud, or Farid Shakarganj, was received from Munshi MOHAN LAL, at *Déra Ghízi Khán*.

Physical.

Captain W. FOLEY submitted a paper, illustrated by specimens, and a map of the geology of the country in the neighbourhood of Maulmein, (correctly *Maulamyeng*.)

It was from a cave in the limestone range on the left bank of the Gyeng river, the *Damatha cavern*, that the elephant's tusk, carved with images of *Buddha*, and the Pali manuscripts above mentioned, were obtained.

A paper by B. H. HODGSON, Esq. on three new species of *Paradoxurus*, found in the Nipál valley, was submitted.

A collection of 148 mounted birds, six birds' nests with eggs, six mammalia, one reptile, and the head and legs of various birds, were presented by R. INGLIS, Esq.

These formed part of the Macao museum lately abandoned. It had been proposed to transfer the whole collection to Calcutta, and as far as concentration is beneficial, it is to be regretted that this munificent intention had been abandoned.

A collection of mounted birds, procured by the Curator, in the neighbourhood of Calcutta.

Specimens of shells, presented by WM. BRUCE, Esq.

A stuffed Alligator, preserved and presented by Dr. EVANS. A small specimen was also exhibited to the Meeting by the same gentleman, who remarks:

"This is a specimen of the broad-nosed species, common to most parts of India, and the kind generally found frequenting old tanks, jheels, and nallahs, and that seldom attains to any very large size. It measures eight feet two inches, and is evidently not a very young animal.

"In comparing it with the small specimen in the glass case, which was taken alive from the Hooghly, it would appear to be a distinct species; as I find a considerable difference in the proportionate length of the tails of the two animals, and also in the number of the spinous processes, the large, having only 35 from the insertion of the thigh to the tip of the tail, while the smaller has 42. The number of carinated tubercles on the neck varies also, but this latter deviation may arise from difference of age or other circumstances; they both correspond as to number and position of their teeth, the upper jaws having 36, the lower 30, and so disposed as to alternate with each other when closed: the larger animal has again two perforations at the extremity of the nose for the admission of the two long sharp teeth of the lower jaw, which are not perceptible in the smaller one.

"Both have the power of diffusing a strong musky odour when irritated, and which I find is derived from two glands opening externally, and situated on the inner side of the ramus of each jaw."

A skull of a Chinese, presented by Mr. W. CARR.

An Albatross, and a collection of shells and insects, presented by Mr. J. T. PEARSON.

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Proceedings of the Committee of the Papers and the Museum Committee, assembled at the Asiatic Society's Rooms on Friday, 29th April, 1836.

The Curator read the following Report upon the Progress of the Museum during the last year:

In reporting on the present state of the Museum, we must revert to what it was last year, when the Society appointed me its Curator; in order to enable you to form an opinion as to the usefulness or otherwise of that appointment.

Many here present may recollect at that time the general bad state of the Museum; the dark and dirty condition of the cabinets; the want of arrangement of the specimens; and the dampness of the apartments containing them; altogether giving a deplorable proof of neglect: and few who do recollect this, will, I hope, be inclined to doubt that a great improvement has been effected.

The first step was to divide the Museum into two distinct parts; one consisting of the works of art; the other of the productions of nature. The numerous valuable specimens of the former, being lost in the rooms below, were removed into the entrance hall, stair-case, and gallery, where they now are, and where they are seen, as we all know, to the greatest advantage: and their removal allowed of the apartments they occupied being entirely devoted to the Natural History portion of the Museum.

On examination, the specimens of Natural History were found, for the most part, in a very neglected state. In osteology, they were numerous, and some of them very valuable; but many were more or less mutilated, and the teeth of the skulls lost; while no catalogue, nor even memorandum, of the greater portion could be found. The first care was to remedy this: the broken specimens were repaired, so far as they could be repaired; and a catalogue was made, which includes every thing concerning them, that can be gleaned from the Researches, and other quarters; whether, as to the specimens themselves, or the names of the donors. In making this catalogue, some difficulty was experienced from the want of any notices of the specimens; and from there being no objects of comparison, by which to discover the species of an animal of which we had, perhaps, but a horn, or a single bone.

While this was going on, attention was also directed to the formation of a cabinet of reference to compare the fossil remains, in which the museum is so rich, with the living congeners, of the animals to which they belonged. This is, in its very nature, a tedious and laborious work; but already there have been articulated and set up, skeletons of a monkey, weasel, cat, rat, musk-deer, horse, parrot, and tortoise. The rhinoceros, which was before but badly put together, has been made the most of that its condition would allow; and an elephant's skeleton; and those of another horse and tortoise are being prepared. As this branch of the museum is of the greatest importance, I am anxious to render it as complete as possible; and with this view, have written to various individuals, likely to further our object, who have promised the bones of the camel, wild buffaloe, large deer of various kinds, the large bullock of Upper India, the tapir, and the alligator; and we may expect soon to receive them.

The most valuable specimens in the osteological section of the museum are, the skulls of the Malacca tapir; the Dugong; the Van Diemen's Land tiger, (whose dentition has been heretofore mistaken in all works of Natural History, until it was corrected in a paper, published last year in the Journal of the Asiatic Society, written from this very specimen;) and the jaw-bone of the gigantic ape shot by Capt. CORNEFOOT in Sumatra; a specimen unique, and valuable as the most lasting, and most striking remains of an animal so strange, that did not this exist, the whole story might be looked upon as a fable.

The specimens of mammalia are but few in number, and their condition on my taking charge was any thing but satisfactory. Some were in such a state of decay as to admit of nothing being done to improve them. Such was the case of the *Thylacinus cynocephalus*, (Van Diemen's Land tiger,) to which I before alluded, its skull and paws having been all that could be retained,—a circumstance, however, in the individual instance which turned out fortunate, as thereby its dentition was discovered. This department of the Museum is increasing, and in a few years I hope it will be worthy of the Society.

In ornithology, although the specimens were rather numerous, their condition was so bad that four-fifths were thrown away. But great accessions have been made during the year; and we are promised specimens from all quarters. I have myself procured in the neighbourhood of Calcutta more than 100 birds; and these, together with several valuable donations, have put the ornithological department on a tolerably respectable footing; and I am therefore proceeding with the catalogue. This catalogue I propose to make something more than a mere numerical one, having been favoured with the valuable notes of Mr. C. W. SMITH, with liberty to make extracts from them; which, together with my own

observations during several years, will enable me to correct many errors, both of description and habit, that have been committed by the best naturalists regarding the birds of India. I may here state, that by following this plan, the Catalogue of the Museum of the Asiatic Society may be made a work of authority, such as to do credit to the Institution by which it is published.

The reptiles in the Museum are numerous and valuable; but they cannot at present be properly displayed, owing to the want of jars, in which to place them. Among them are many of the rarer Indian serpents. To my friend Lieut. CHIENE, the Society is indebted for many specimens during the past year.

In fishes the collection is not very extensive, though it contains some of the rare kinds. These also cannot be shewn, until our supply of jars and bottles shall arrive from Europe. In this branch, Lieut. MONTRIORE, of the Indian Navy, and Mr. SHAW, of the Surveying Vessel *Flora*, have been the principal donors.

There was no cabinet of insects belonging to the Society. The whole of the specimens in this department consisted but of a few preserved in spirits; and those purchased along with the Sylhet collection of shells. During the rains I employed my servants to collect; and they procured what may be considered a fair sample of the Bengal Coleopterous and Hemipterous insects of the season. They consist of very many genera and species, and in individual specimens amount to several hundreds in number. The collection is purposely rich in duplicates, to allow of some being placed in the cabinet of the Society; and sent to various societies and scientific men. I am also selecting for the Society's cabinet a series of duplicates from my own; which, as it is the result of the labour of nine years in Bengal, Behar, and Orissa, contains many specimens but rarely to be procured. At present our whole collection is scarcely large enough for systematic arrangement; the specimens therefore are placed according to their locality and donors; a plan which has also the advantage of marking their geographical distribution.

The American land and fresh-water shells, presented by Dr. LEA, and those from Sylhet; together with a few specimens presented by Lieut. HURTON, and a small number of marine shells, composed the Society's collection of shells. We have also had a few presented during the year; and I have been enabled to add considerably to this branch of the Museum, by collecting the land, fresh-water, and marsh shells of the neighbourhood of Calcutta, and by transferring duplicates from my own cabinet.

I may sum up this part of the report by stating, that, during the past year there have been added to the Society's Museum, in osteology, 19 crania, nine complete skeletons, and between three and four hundred detached bones of various animals; 12 specimens of mammalia; 133 mounted birds; from 30 to 50 reptiles, and 15 fishes; in all upwards of 500 specimens of the vertebrated animals; and of the invertebrata, we have had 150 shells, several crustacea, and several hundred insects: that many of these are rare and valuable; many as yet undescribed, and one bird, the *Urinorynchus Griseus*, is all but unique.

To facilitate the collection of specimens for the Museum, a paper of brief directions for collecting and preserving them was written: this has been extensively circulated. A paper on the same subject was also composed, in which ample details were given; and this was published in the *Journal of the Society*. We are now reaping the benefit of these instructions, and we shall do so still more as the seasons for collecting come round.

With reference to catalogues, I have before stated that, that of the osteological section of the Museum is now in the printer's hands; as is also that of the mammalia. The catalogue of the birds is in progress; and in consequence of the aid I shall derive from Mr. SMITH's notes, it will, I trust, be valuable when completed. That of the reptiles and fishes cannot be undertaken until we have the means of displaying those objects. That of the shells must be delayed until the promised description of the land and fresh water shells, by Mr. BENSON, shall be published. In the mean time, no want of a catalogue will be felt in this branch of the Museum; the name of each specimen being written, together with its locality, on the ebony tablet, upon which the shell is placed.

One very important object to the Society is, I conceive, to become the means of extending a knowledge of the natural productions of India, to scientific men in other countries. I have prepared duplicate specimens of land and fresh-

water shells to send to England, France, America, the Cape of Good Hope, and the Isle of France. I have also prepared duplicate specimens of insects from my collection, to send to various scientific societies and individuals in England. And I have sent some specimens of birds, purchased in Calcutta, to a gentleman, Monsieur VIROT, who is celebrated for his labours in Taxidermy at the Cape. These were transmitted through Sir CHARLES D'O'VLY, who had kindly undertaken to forward them; and I took the liberty of sending them in the name of the Society; though, of course, as I was unauthorised to do so, I did not burthen the Society with the expence of the purchase. It has been proposed to Monsieur VIROT, to send African birds to our Museum in exchange, and Sir CHARLES has no doubt of his acceding to the proposition. Should he agree, the Society will perhaps give me permission to forward to him the duplicates now upon the table.

With reference to the financial part. Of the 50 rupees monthly for contingencies, I have given 40 to M. BOUCHEZ for his assistance; and subsequently increased his salary to 50 Compy.'s rupees, by reducing my own from 150 Sicca to 150 Compy.'s rupees; by this the Society also is a gainer to the amount of a few rupees. Of the sum for contingencies, all has been expended, and about 180 in excess. This sum I am prepared to refund, should it be thought proper for me to do so.

It was stipulated, that I should give up my occupation as Editor of the India Journal of Medical Science; and that I should rent a house near the Society's, if procurable, or entertain the means of daily attendance. I gave up the Editorship of the Journal on the publication of the number following my appointment. But with regard to the house, I found insurmountable difficulties in the way; none being procurable but the one immediately opposite, and that at a rent far exceeding my means to pay. I had recourse, therefore, to the alternative, and my attendance has been regular, always once, and generally twice, a day.

With reference to the present year, (should my appointment be renewed,) I do not anticipate the expences will equal those of the past; the cabinets, being now nearly complete, I propose to finish the Ornithological and Conchological catalogues, and to arrange the fishes, reptiles, and insects. With Mr. PRINSEP's aid too, the fossil remains will be examined and the new ones described. While generally, the new specimens in various departments of the science will be prepared and arranged in the Museum, as they come in. We have reason to believe these will be very numerous.

Such have been the labours of the past year, and what I propose for the present. I could have wished to have done more, particularly in completing the catalogues; but the difficulties in arranging a collection of Natural History from the beginning, are greater than any one not conversant with them can imagine. In all departments there was here much to be done; and of some there was not a vestige when I took charge. The Museum will now, I trust, go on thriving, and be worthy the name of the Society to which it belongs. Its establishment, as a focus into which may be collected the natural treasures of the East, is an object I have long had at heart: before I was a Member of the Society, several years ago, I wrote to the President, and proposed what has now been accomplished, and what it will be my pride to be permitted to sustain. I intreat you to carry it on upon its present footing, for at least another year; when I am sure you will be as anxious for it to continue, as I am myself. The attention of mankind is now directed to the natural sciences, as is sufficiently proved by the publication of so many books concerning them; and none is more attractive than zoology. To the attention the Society has lately given to these sciences, the great increase of Members is to be attributed; an increase during the last year unparalleled in its annals; but which I believe will be fully equalled or surpassed in the present. Its reputation will also, I doubt not, be as much enhanced by the researches of its members in Natural History, as it has been, and is, by their labours in the learning of the East.

Gentlemen, upon this point I may quote the words of our illustrious founder, who said, that the inquiries of the Society "will be extended to whatever is performed by man, or produced by nature." The former part of this prediction

our predecessors have accomplished with ability and success; it is our's to perform the rest. And safely may we prognosticate, that, under those who now direct its proceedings, the Asiatic Society of Bengal, will, not only fully uphold the reputation it has so well merited, by inquiries into whatever is performed by man: but, also maintain it, and increase it, by researches into the productions of nature.

J. T. PEARSON, *Curator, Museum, As. Soc.*

Calcutta, 1st May, 1836.

Resolved, that the Report be adopted and presented at the next Meeting, and the excess of expenditure for contingencies above the sum noted on the 6th May, 1835, (about 200 rupees) be recommended to be sanctioned.

Resolved further, that the Committee are highly pleased with the arrangements adopted by Dr. PEARSON in the Museum, and with the progress it has made under his supervision; and they have no hesitation in recommending to the Society a continuation of the same system which has proved so beneficial and effective during the experimental year.

The Treasurer, Babu RAM COMUL SEN, having laid before the Committee a statement of the funds of the Society, and an estimate of the calls on them during the ensuing year.

Balance of Cash,	1,325	15	9	
Government Paper,	17,500	0	0	
				18,825 15 9
Number of Subscribing Members, 92×64=per an.				5,888 0 0
<i>Estimated Receipts.</i>				
Balance of Cash,	1,325	15	9	
Estimated Collections,	5,600	0	0	
Interest on Paper,	875	0	0	
Income,				7,600 15 9
<i>Estimated Charges,</i>				
Establishment and Charges,	2,875	0	0	
Cabinets for fossils, &c. (ordered),	310	0	0	
Journal Subscription,	1,200	0	0	
Repairs of the House,	200	0	0	
Printing 20th Volume,	3,000	0	0	
One month Curator's salary due,	200	0	0	
Excess on Contingent Bills of do. say,	200	0	0	
Total Charge,				7,985 0 0
Add Money advanced by the Secretary for Cabinets, &c.,				186 15 10
				8,171 15 10
Deficiency on the ensuing year,				571 0 1

Resolved, that upon the above view of the means of the Society, it does not seem possible to provide for the payment of 200 rupees per mensem, for the support of a Curator's establishment during the ensuing year, without encroaching upon the vested funds of the Society. The Committee therefore leave it for the consideration of the Members at large, whether some other means may not be adopted for raising the amount necessary for this very desirable object. Various plans have been suggested in Committee, such as;—1. reservation of the vested fund for the publication of the Transactions; 2. voluntary donations, from such members, as may be interested in the support of the Museum, and from the public; 3. charging for admission of visitors. These plans the Committee deem it advisable to leave open to discussion in the Society at large,

trusting that some expedient may be devised for upholding the Museum, which they do not think it will be possible to maintain in a state of efficiency without having a paid Curator.

EDWARD RYAN,
Chairman.

Asiatic Society's Rooms, }
April 29, 1836. }

XI.—Miscellaneous.

- 1.—*Postscript to the Account of the wild Goat of Nepál, printed in the Sept. No. of the Journal, page 490. By B. H. HODGSON, Esq.*

Carefully as I thought my account of the wild goat of Nepál, recently published by you, was executed, I find that there is one material error in it, viz. the statement that the species has only two teats or mammæ. A recent dissection of a fine male led to the notice of the fact that there are four teats, which fact was confirmed by the examination of two live females. There can, therefore, be no question that this species of goat has four teats: and the circumstance is so remarkable, that I propose to substitute the name *Quadrirammiss* or four-teated, for the popular name of *Jhálal*, under which I described it. Deer are distinguished by four teats, goats and sheep, heretofore, by two; the intermediate genus antelope, by four or two, in the several species. *Capra Quadrirammiss vel Jhálal*, by its four teats, offers a singular and unique approximation (in this genus) to *Cervus*; and another proof that the infinite variety of nature cannot be designated by our artificial signs and peremptory divisions. Antelope, *Capra*, and *Ovis*, how shall we contradictinguish them? Solid-cored horns, in the first, is no unerring mark: and now we have a species of the second, and a beardless species too, abandoning his congeners to ally himself with *Cervus*, quoad the number of mammæ.

- 2.—*Notice of the Basilosaurus, a new marine fossil Saurian, discovered in America. By H. PIDDINGTON, Esq.*

The discovery of this most gigantic fossil species is due to Judge BREE of Arkansas, by whom, in 1834, the first fossil vertebra was found in the marly banks of the Washita river, in the Arkansas territory. In the latter end of the year, more vertebræ, fragments of the lower jaw, &c. were discovered in Alabama, about 30 miles north-west of Chairborne; another portion of jaw, with several teeth; an os humeri, several immense vertebræ; numerous fractured ribs; a molar tooth; the extremity of a tibia; portion of the shoulder, pelvis, &c. &c. were now found: and recently (May 1835), another skeleton has been discovered, and a large collection of the fossil remains is promised. Near the same spot a specimen of the caudal vertebræ of the *Mosaurus* or *Maestricht monitor* was also found.

It is assumed, that the bones, though great disparity exists in their proportions and size, constitute portions of one species, and the structure of the lower jaw, which is *hollow*, place it amongst the Saurians as a lost genus. The comparative smallness of the bones of the extremities seem to indicate the tail as the principal organ of motion, and the superior extremities must have been fins or paddles.

The train of vertebræ extending upwards of 100 feet in length in one locality, and estimated to be 150 feet in the Arkansas specimen, shew, that this gigantic animal must have probably attained upwards of this length,

meriting thus most fully the name *Basilosaurus*; which our honorary member, Dr. HARLAN, Professor of Comparative anatomy to the Philadelphia Museum, has bestowed upon it. In the Transactions of the Geological Society of Pennsylvania, which I have placed upon the table for the inspection of members, previous to sending it up to Dr. FALCONER, is a detailed paper by Dr. HARLAN, and two beautiful plates, illustrating this splendid discovery.

H. P.

3.—*The Balloon.*

We should not be exercising due vigilance as editor of a scientific journal, were we to omit recording the first ascent of a balloon from the plains of Bengal on the 21st of the past month (March.) M. ROBERTSON, the aeronaut, a Frenchman, who had made sixteen previous ascents in various parts of Europe, came expressly to India for the purpose of astonishing the natives with the novel tomasha of a human being wafted out of sight into ethereal space in his fairy car: and such competition is said to have prevailed at Paris*, for the glory of being the *first*, that M. ROBERTSON was fain to hurry hither before the balloon itself was ready. The bad success of his attempt may be partly attributed to the imperfect manner in which this indispensable article was supplied here.

The local and pecuniary arrangements seem to have been very ill judged; the selection of a spot of difficult access, at the further end of Garden Reach, tended only to prevent those who had subscribed from attending; choking the only land road, and the river, with non-paying visitors, who expended, what would have amply remunerated the aeronaut, in conveyances thither! The distillation of the gas was effective, and the balloon rose well, but ere it had attained a mile of height, it was seen to return so rapidly earthward, that great apprehensions were entertained for the traveller's neck. It appeared to us that when M. ROBERTSON entered the car, and attached the valve-strings to the netting, the valve was pulled open, thus enabling the gas to escape freely from the first; for the silk was found quite sound at its return. The aeronaut himself talked of a sudden collapse of the balloon from condensation of the gas; but this was a deception: when it began to fall rapidly, the resistance of the air below pressed up the slack of the balloon like an umbrella, and aided in driving out the gas from the open valve above; in fact, the car was supported in its descent as by a parachute, and could not consequently quicken its pace to any dangerous extent.

The experience of such an accident should very much aid to increase the confidence of the aeronaut; for it is plain that with a little contrivance the balloon may in all cases be made to act as a parachute on the loss of its gaseous contents. We trust the next ascent will be made under more auspicious circumstances, and we hope that it may be possible to turn it to some small use in a scientific point of view, by ascertaining at least the decrement of heat and moisture at increasing altitudes, as well as the height of the reverse current of the upper atmosphere.

[This notice could not find a place last month.—Mr. ROBERTSON has since departed for the more cheering prospects of an ascent at Lucknow.]

* This competition reminds us of the rivalry in America to supply us with ice, which has at last led to a confirmed and durable scheme for regaling us with that luxury at a very cheap rate. Having noticed at length the first ice cargo, we have thought it unnecessary to recur to the subject; but the completion of a permanent ice-house will enable us hereafter to judge, of the best mode of preserving the frozen element. The tan bed intended for this object, from becoming wet, had an opposite effect, and was indeed nearly the cause of a conflagration! while the carbonic acid gas extricated from its fermentation, killed a man who incautiously descended to examine the chamber.

Meteorological Register, kept at the Assay Office, Calcutta, for the Month of April, 1836.

Day of the Month.	Observations at 10 A. M.							Observations at 4 P. M.							Register Thermometer Extremes.		Rain.	Wind.		Weather.				
	New Stand. Barometer red. to 32°.	Old Stand. Barometer at 32°.	Wet Baro- meter at 32°.	Aq. Ten. deducted.	Thermome- ter in air.	Wet-bulb Depress.	Leslie's Dif.	Hair Hygrometer.	New Stand. Barometer red. to 32°.	Old Stand. Barometer at 32°.	Wet Baro- meter at 32°.	Aq. Ten. deducted.	Thermome- ter in air.	Wet-bulb Depress.	Leslie's Dif.	Hair Hygrometer.		Cold on roof.	Heat on sun.		Morning.	10 A. M.	4 P. M.	Morning.
1	29.830	849	26.793	1056	80.5	5.7	4.5	95	20.617	740	450	1.290	88.1	12.5	12.9	77	71.2	105.0	mist.	fine.	o.	sw.	sw.	fine.
2	829	859	725	1134	81.4	11.6	10.1	81	725	760	416	1.344	89.1	12.5	12.9	77	69.8	99.5	clear.	do	sw.	sw.	do	
3	874	945	722	1183	82.4	14.2	10.8	80	738	780	437	1.343	87.3	13.7	11.8	79	68.2	113.3	do	do	nw.	sw.	do	
4	849	879	750	1089	82.4	5.8	5.6	84	738	779	437	1.320	87.3	13.7	11.8	82	70.0	104.2	hazy.	do	sw.	sw.	do	
5	819	863	748	1115	85.7	9.8	8.3	85	761	704	430	1.274	87.6	12.1	10.6	82	66.8	96.7	storm rn.	do	se.	se.	cloudy.	
6	774	800	748	1070	82.9	6.5	4.9	94	663	683	330	1.353	89.0	19.6	18.3	64	73.3	111.0	do	do	sw.	sw.	do	
7	807	837	622	1215	89.5	7.1	6.0	93	686	734	285	1.449	90.9	12.5	10.1	83	74.4	105.2	do	do	sw.	sw.	hazy.	
8	829	869	691	1173	88.5	5.6	5.1	96	629	742	341	1.401	90.3	8.6	8.7	89	74.2	105.4	clear.	do	sw.	sw.	do	
9	775	795	654	1141	85.1	4.9	4.9	95	626	671	227	1.444	90.8	14.7	16.2	70	73.2	119.5	do	do	sw.	sw.	do	
10	806	841	599	1242	86.3	5.4	5.4	94	680	731	250	1.494	91.3	13.4	15.1	65	74.5	131.3	do	do	sw.	sw.	do	
11	752	783	512	1271	86.8	7.6	7.4	90	672	719	225	1.506	92.3	17.5	19.7	61	73.7	126.2	clear.	do	sw.	sw.	do	
12	796	835	587	1338	88.2	8.0	8.0	88	587	636	130	1.531	92.9	12.4	12.0	61	74.6	115.4	do	do	sw.	sw.	do	
13	735	775	505	1270	87.3	6.3	5.8	92	574	623	161	1.462	92.1	16.2	18.2	61	75.1	101.8	do	do	sw.	sw.	do	
14	849	889	662	1177	84.5	8.0	7.3	89	634	594	663	1.531	92.9	9.2	8.7	86	69.0	93.5	cumuli.	do	sw.	sw.	cum. cir.	
15	811	849	640	1171	85.3	5.1	4.7	91	613	665	340	1.478	89.9	8.4	8.3	86	69.0	93.5	heavy storm	do	sw.	sw.	cumuli.	
16	704	840	620	1220	86.2	9.7	9.4	84	607	730	330	1.445	91.2	10.5	11.5	80	72.2	106.6	storm cum.	do	sw.	sw.	do	
17	768	837	592	1255	86.4	7.4	6.4	86	607	711	147	1.464	92.7	17.8	19.0	56	74.5	125.3	cumuli.	do	sw.	N.	do	
18	766	813	474	1339	87.7	10.6	11.2	82	619	670	678	1.529	93.8	17.2	20.0	54	75.0	129.2	clear.	do	sw.	sw.	do	
19	784	808	408	1292	87.1	8.9	9.8	89	548	659	110	1.549	93.3	14.5	15.2	54	75.0	117.2	do	do	sw.	sw.	hazy.	
20	713	752	406	1292	87.9	7.8	7.7	89	571	622	649	1.573	93.3	24.4	23.2	55	75.7	117.2	do	do	sw.	sw.	do	
21	667	704	441	1263	86.1	8.1	7.0	92	559	619	226	1.390	91.0	9.3	7.2	92	77.5	90.8	do	do	sw.	sw.	do	
22	637	697	346	1339	86.2	9.2	8.8	80	494	559	169	1.393	89.5	15.6	13.5	78	77.5	90.8	do	do	sw.	sw.	do	
23	639	697	346	1279	87.1	9.3	8.2	90	514	567	115	1.454	91.0	11.9	10.2	87	77.5	90.8	do	do	sw.	sw.	do	
24	614	655	380	1305	87.6	10.4	9.0	88	514	567	115	1.454	91.0	11.9	10.2	87	77.5	90.8	do	do	sw.	sw.	do	
25	700	765	447	1309	88.5	8.8	7.1	91	508	646	108	1.469	91.7	11.8	10.0	84	74.2	96.2	do	do	sw.	sw.	do	
26	794	796	534	1256	87.4	8.9	7.5	93	507	630	109	1.429	91.1	9.8	10.1	86	76.2	96.2	do	do	sw.	sw.	do	
27	734	796	534	1214	86.3	8.9	6.8	94	583	630	155	1.475	91.5	11.1	10.9	87	74.2	104.0	do	do	sw.	sw.	do	
28	797	755	541	1214	86.3	7.9	6.5	94	583	630	155	1.475	91.5	10.1	14.0	85	79.0	102.8	do	do	sw.	sw.	do	
29	632	661	390	1292	87.8	7.4	7.0	92	500	559	600	1.489	93.9	16.4	17.6	68	74.2	114.3	do	do	sw.	sw.	do	
30	651	685	386	1267	87.7	8.1	6.3	87	507	553	654	1.489	93.9	16.4	17.6	68	74.2	114.3	do	do	sw.	sw.	do	
Mean.	29.755	792	28.562	1230	86.0	8.1	7.4	90	620	669	231	1.438	90.9	13.3	13.3	77.0	73.5	110.9	0.17	0.17	sw.	sw.	SW. monsoon.	

Newman's Barometer this month stands .037 at 10 A. M. and .049 at 4 P. M. lower than my former standard. To ascertain whether the fault was in the compression tube by which the zero of the scale in the latter is corrected for temperature, this principle was dispensed with, and the instrument read in the common manner from the 27th inst. Frequent storms, dry.

